PAINT and VARNISH Production.

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHE

APRIL
1959

ADVANTAGES

RCI PENTAERYTHRITOL

OFFERS YOU

1. UNIFORM QUALITY—negligible ash content assures light colored resins and truer reactivity . . . consistently high hydroxyl content results in dollar savings for you. **2.** CONTROLLED PARTICLE SIZE—a minimum of dusting eliminates loss during loading . . . rapid solubility prevents conglomeration and charring. **3.** EASY HANDLING—RCI PENTA 681 is a non-hygroscopic, free-flowing, granular material . . . stable in storage. **4.** READY AVAILABILITY—warehoused in many strategic locations . . . available with RCI PHTHALIC and/or MALEIC ANHYDRIDES in economical mixed shipments.

With RCI PENTAERYTHRITOL 681 (Technical Grade) you get all four of the above advantages so important to the manufacture of your alkyds, rosin esters, in situ varnishes, synthetic drying oils and tall oil core binder vehicles.

For full details write RCI for the new *Bulletin — Technical Pentaerythritol 681.*

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Hydrochloric Acid • Formaldehyde • Glycerine • Phthalic Anhydride
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Creative Chemistry . . . Your Partner in Progress RCI

REICHHOLD CHEMICALS, INC.,
RCI BUILDING, WHITE PLAINS, N.Y.

▲ Shell Chemical technician demonstrates new high solids spray gun. Shell introduced the Gusco Process Equipment at the 1958 Paint Show, with continuous demonstrations.

New portable Gusco Process Equipment made by A. Gusmer Inc., Woodbridge, New Jersey, supplies Epon resins and curing agent in proper proportion from portable heating and pumping machine. Coating resists acids and alkalies, aliphatic and aromatic hydrocarbon solvents. ▶

Now...sprayable, solventless Epon® Resin coatings...

cut application time, eliminate solvent losses and fire hazards!

Apply a one-coat protective coating *up to 30 mils thick* on a vertical surface without sagging?

Impossible . . . until Shell Chemical's Epon resins and A. Gusmer Inc.'s new heated spray gun were teamed up. This revolutionary new technique is capable of applying two-component resin systems on metal, concrete or wood surfaces at rates up to *500 square feet per hour!*

Here's how it works:

Heated, solvent-free Epon resin-based paint and curing agent are fed to the spray gun through a positive metering system in correct proportions. They meet in the gun's mixing chamber and are forced through the orifice under 300 to 1500 p.s.i. pressure. It's the pressure of the liquids, not compressed air, that creates the spray. Result: overspray, misting, toxicity, and fire hazards are virtually eliminated.

Sprayable, solventless Epon resin-based coatings cure at normal room temperature and can be handled 4 hours after application . . . can often be placed in service after overnight cure . . . form a protective armor that resists corrosion, abrasion, chemical attack, heat, and humidity.

Your Shell Chemical representative is ready to tell you the complete story of this important new coatings development. Call him now! Write for information on sources of mixing and metering equipment and 100% solids coatings.

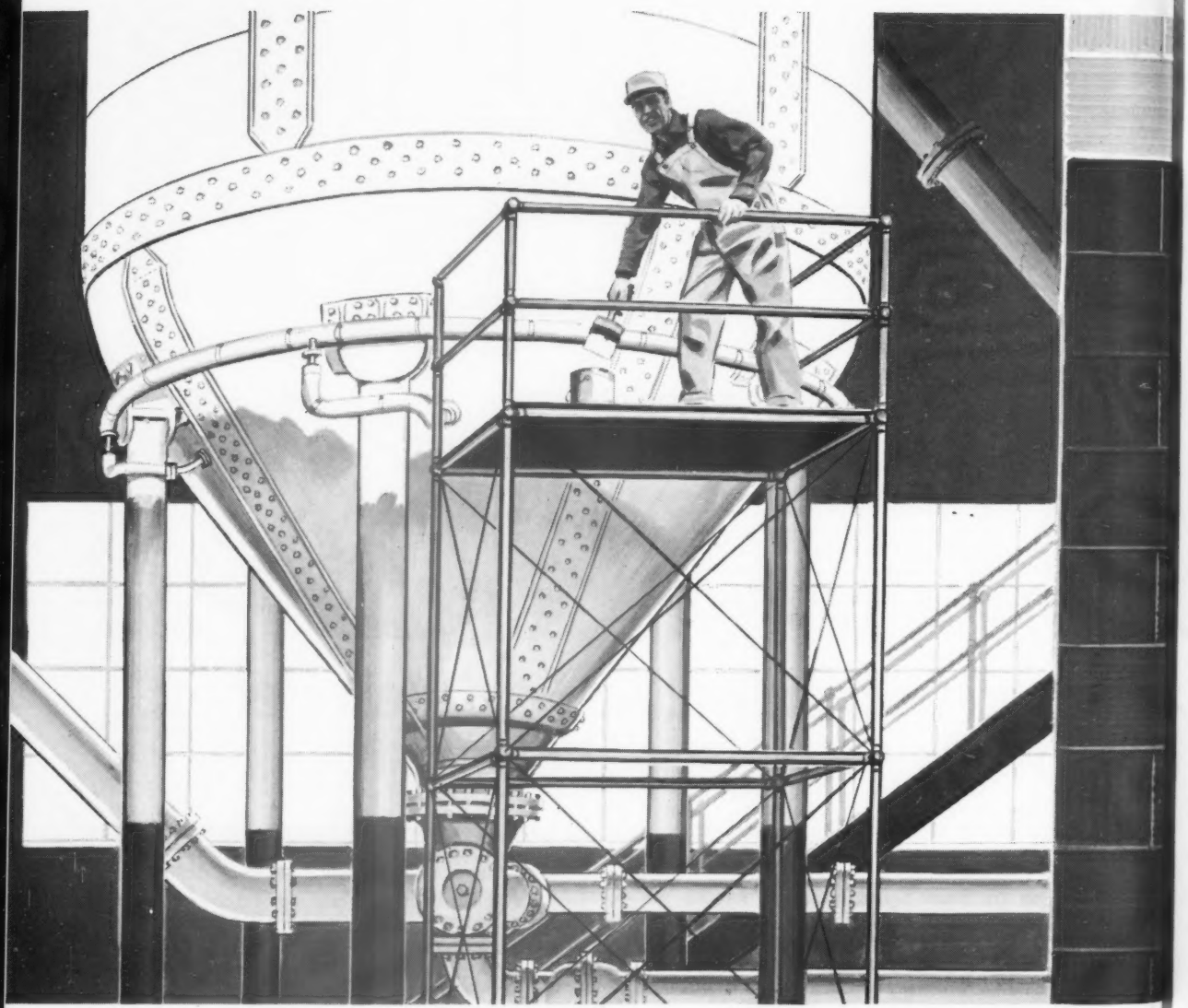
SHELL CHEMICAL CORPORATION
PLASTICS AND RESINS DIVISION
CHICAGO • CLEVELAND • LOS ANGELES • NEW YORK
IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

SHELL

More mileage, greater durability in maintenance finishes with

UNITANE® OR-342

TITANIUM DIOXIDE



Industrial users who formulate interior maintenance finishes from typical mill whites want good performance *plus* economy. That's why *your* mill whites should contain UNITANE OR-342. This outstanding TiO_2 offers:

- Maximum opacity for extra mileage in every gallon
- Brightness unsurpassed for clean whites, grays, ivories and other pastels
- High resistance to gases, fumes, and chemicals
- Excellent mill performance, ease of dispersion, and vehicle compatibility

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For economy, ease of handling, appearance, and durability under hard service conditions, you can't buy better than UNITANE OR-342.

Ask your Cyanamid Pigments representative for information...and for details of UNITANE pigments—either anatase or rutile—suitable for your formulations.

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(Established in 1910 as The Paint and Varnish Record)

VOL. 49 APRIL, 1959 NO. 5

FEATURES

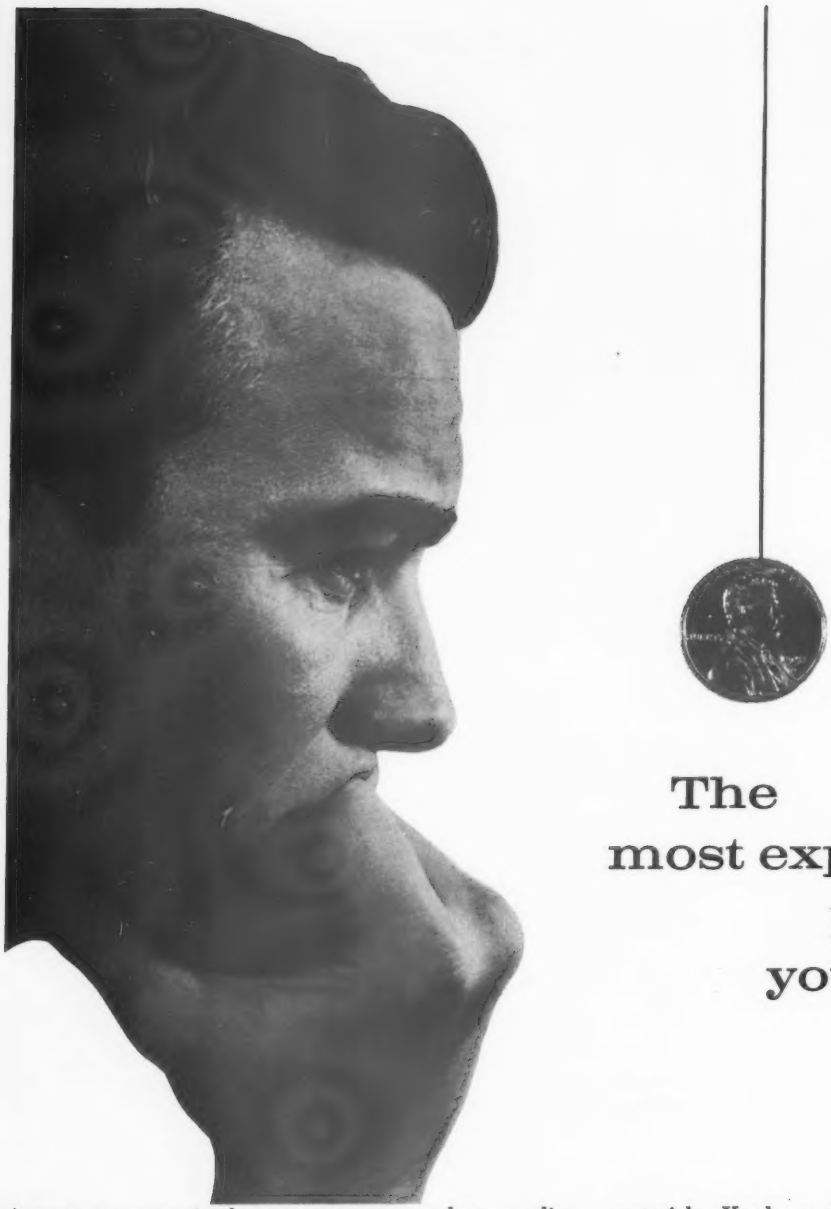
PRODUCTION

FOREIGN DEVELOPMENTS

DEPARTMENTS

NEXT ISSUE

Our May issue will feature a comprehensive series of articles on pigment dispersion equipment. Principles of operation, formulations, production capacities, etc. of each type of equipment will be discussed.



The most expensive penny you can save

Anyone can cut price but not everyone produces quality. The penny you may save on coating resins can develop into the most costly missing ingredient in your finished product. The eventual cost in spoiled batches, returned merchandise and lost time may far exceed the small saving. Less than best in resin quality can seriously mar your company's reputation in *dollars*, not pennies.

Specify PLASKON Coating Resins and you'll find there are none better at any price. They are precisely controlled products made from carefully selected, top quality raw materials. Kettle conditions are closely controlled and resins are in test throughout the production cycle for quality and uniformity.

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Allied Chemical

EDITORIAL COMMENT

Very Aptly Said!

THE importance of technical and production people in the success of any large industrial organization was stressed by Dwight P. Joyce, chairman and president of the Glidden Company.

In a speech at the annual meeting of Glidden's Paint Division superintendents and technical directors he said:–

"With all due respect to our illustrious sales departments, I would like to say that there would be no sales department,—and in fact, no Glidden Company—were it not for the brilliant brain children of our laboratory people who are carefully reared and nurtured and sent out into the profit productive world by you men who run the stills, turn the pebble mills and fill the cans."

Paints and Missles

PAINTS are playing an important role in our country's missle program, particularly in helping to obtain scientific data.

The black bands and spiraling stripes girding many of the rockets serve as photographic measuring points. From these points engineers can determine the rocket's rotational rate, its angle of flight and even deviations from predicted course.

In some cases, rockets will carry swatches of paints, which are used either to resist corrosion at delicate points, or to protect the electronic equipment inside from excessive heat at these predetermined points.

The Jupiter C, which has succeeded in orbiting three satellites, utilizes a specially-made paint on its nose cone designed to help control the internal temperature. Application design of the paint is a heavy determining factor. Black and white stripes are used to absorp and reflect heat. As the cone spins the stripes keep within desirable limits the wide range of temperature extremes encountered by the rocket in flight.

Specialized types of paints are used on the inside of missles designed for recovery. These paints are sensitive to temperatures, changing color permanently when exposed to different ranges of temperature. Use of these paints has enabled rocket scientists to cut down the number of thermocouples, which are used to measure temperature changes.

To the average citizen paint is primarily used for beautifying and protecting the home, property and products. Little does he know that it is reaching out into space for new worlds to conquer.

Nothing Like Lacquer

SINCE the Japanese broke trade relations with Communist China last year, Japanese lacquer-ware craftsmen have watched their supplies of lacquer dwindle to a serious level. With the possibility that the traditional Japanese art might face virtual extinction for lack of high quality lacquer, the Japanese craftsmen are clamoring for immediate resumption of trade ties with Communist China.

In the past, both Communist China and North Viet Nam supplied Japan with 98% of her lacquer needs which ran about 800 tons per year. Chinese lacquer is used on bicycles, rolling stock, fishing rods, umbrellas, lanterns and in the artcrafts such as lacquer-ware boxes and dinnerware. While lacquer-like materials based on cashew oil and synthetic resins have been used, the Japanese craftsmen find little satisfaction in these substitutes and strongly maintain there is nothing like lacquer in the production of high quality products.

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With Gen-Flo, the balanced styrene-butadiene latex, you can build pigment volume concentration up to 65% in your paints. This enables you to make a high-quality latex paint, at lower cost, which has, among its customer-demanded qualities, outstanding scrubbability. Tests prove that thousands of strokes by the Gardner Straight Line Scrubber fail to "break" paint using Gen-Flo as the vehicle. Carefully controlled production and extensive field testing prove Gen-Flo is your best latex buy. Write today for complete product information and versatile formulations, specially worked out by paint experts to help you increase your paint sales and profits.

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- **Scrubbability**
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- **Mechanical stability**
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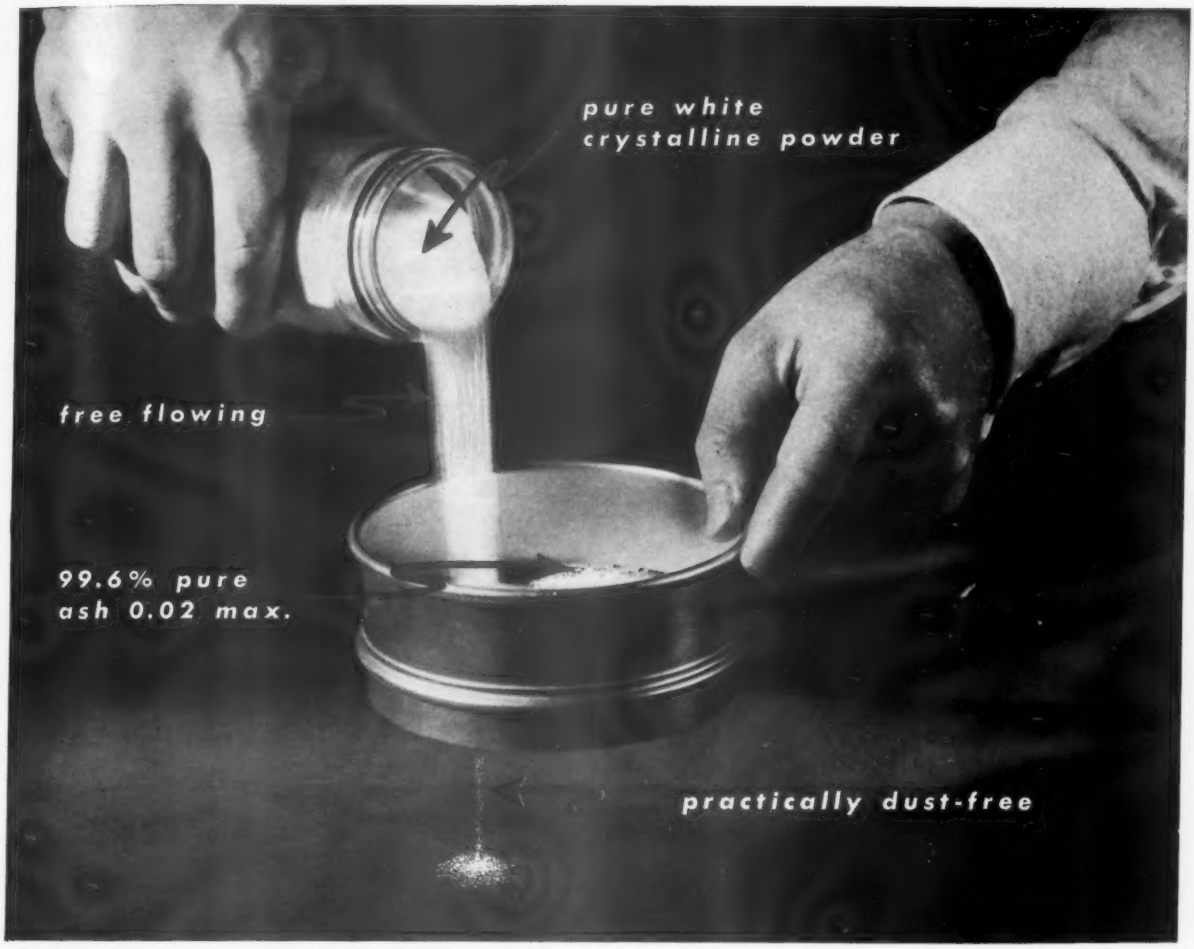

lighter colored, lower cost end-products start with National® FUMARIC ACID

National Fumaric Acid has the ideal combination of chemical and physical properties for better polyesters, alkyds, ink and varnish resins, drying oils, plasticizers, pharmaceuticals, etc.

It is made by an exclusive direct catalytic-oxidation process in the world's largest Fumaric Acid plant by America's oldest volume producer. It gives absolutely uniform results and yields consistently uniform end-products.

And, as an added economy, you get mixed carload or mixed truckload prices on combination orders with any of the National Resin Chemicals listed from plant or principal branch warehouse stocks.

So, for lower cost, lighter colored end-products, always start by ordering National Fumaric Acid.

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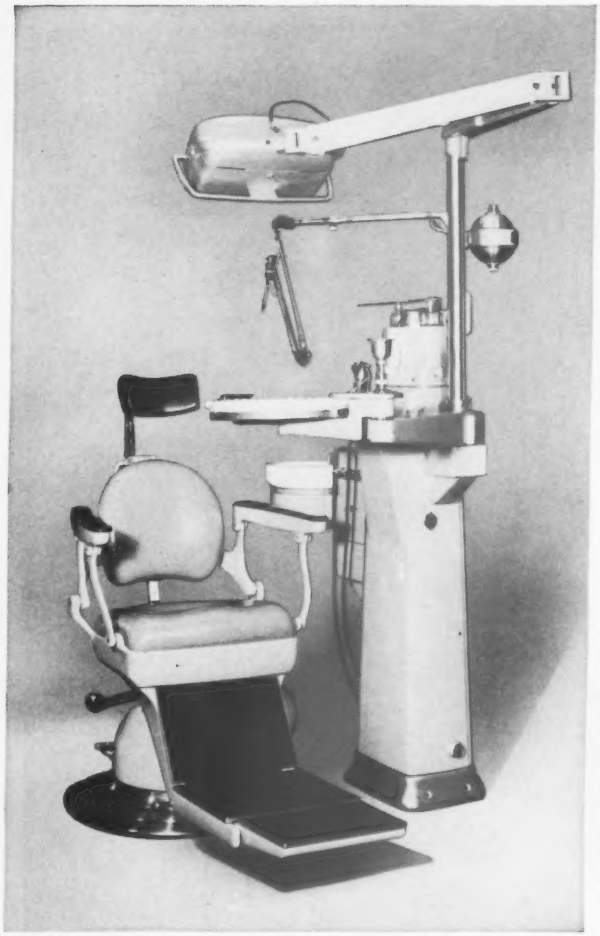


DESIGNED BY VLADIMIR KAGAN FOR KAGAN-DREYFUSS, INC.

They're both chairs, but...

each is in a class by itself . . . like Wyandotte's PURECAL® O

These two chairs show what a vast difference a change of purpose can make. One is designed for comfort, the other for convenience . . . they're as far apart as pleasure and pain.

In calcium carbonates, too, differences become most significant in relation to their purpose . . . and all calcium carbonates are definitely *not* alike. Wyandotte PURECAL O is in a class by itself! Reason: Wyandotte's double refining — a unique reaction process — yields precipitated calcium carbonate of exceptional purity, uniformity, and whiteness. Particles are agglomerate-free, consistently cubical for best flow and leveling.

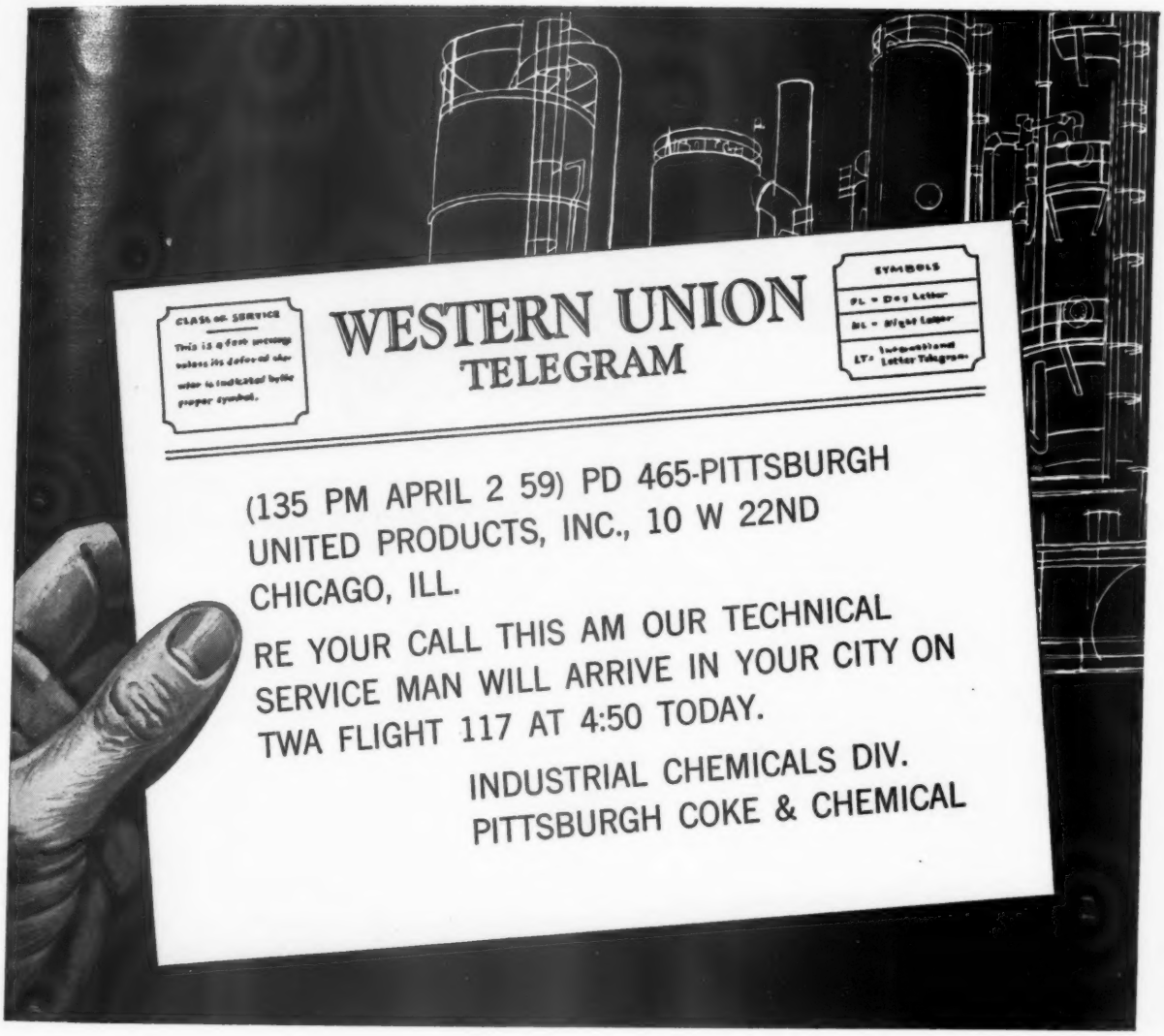
Here's a practical application these properties make possible: By weight, two lbs. of PURECAL O can replace about three lbs. of prime pigment (such as TiO_2) *at a definite decrease in cost.* So you can cut costs, yet maintain the same quality. Other formulations let you improve quality without increasing costs.

Why not put PURECAL O to the test in your own formulation? Write for samples and technical data, today. *Wyandotte Chemicals Corporation, Dept. 755-P, Wyandotte, Michigan. Offices in principal cities.*

Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION

PACING PROGRESS WITH CREATIVE CHEMISTRY



Your Call for Pittsburgh Technical Help Gets Action!

Pittsburgh Coke's job as a basic supplier of industrial chemicals only *begins* when your shipment leaves our plant. For often, you may be planning to utilize the uniform purity of Pittsburgh Chemicals to help you upgrade product quality . . . or to cut production costs by reducing down time.

Whatever your plans, you'll find that the services of a Pittsburgh Technical Service man are completely at your service . . . right on your plant floor when needed.

Our experienced Technical Service men (and technical service is their *full time* job) know processing and production from *your* side of the business. You'll appreciate the "sleeves-up" way they tackle a materials application problem.

The next time you need processing help, call for a Pittsburgh Technical Service Representative. A phone call or wire will bring prompt action.

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for high consistency in paints

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for medium consistency in paints

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for low consistency in paints

AZO acicular zinc oxides are free from detrimental colloidal fines, produce exceptional weathering properties in exterior paints, and are resistant to hard settling during shelf storage. For general use in the production of paints and enamels.

1ST

American Zinc was the first, *and is still the only* producer of acicular lead-free zinc oxides covering a wide range of oil absorptions from high to low *and including the intermediate ranges.*

AZODOX has twice the apparent density, half the dry bulk. Cuts storage space in half. Except for density, all physical properties are unchanged. And all chemical properties are unaltered. AZODOX saves you money in handling, storing, mixing, grinding. Costs no more than conventional zinc oxides.

AZO acicular zinc oxides (AZODOX or conventional) are recommended for the extra durability, the finer weathering qualities they give to paint. Available in a wide range of oil absorptions to meet your requirements.

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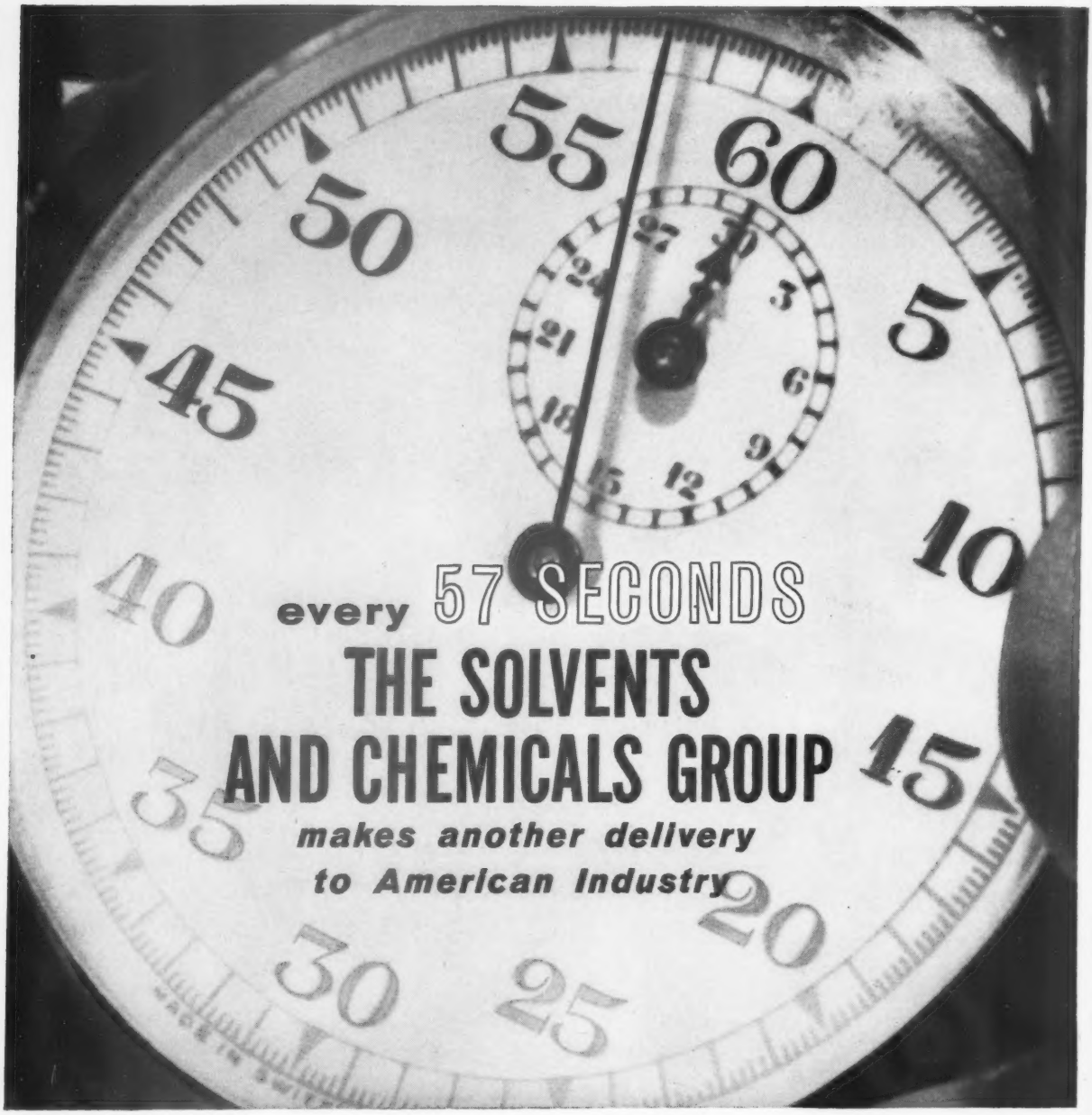
One of the biggest advantages of Dow Vinyltoluene is its unique ability to form clear, useful vehicles with all commercially important drying oils, including dehydrated castor, linseed, safflower, soya, menhaden, cottonseed, coconut and tall oil.

Besides its compatibility with less expensive drying oils, Dow Vinyltoluene also permits the use of less expensive solvents with actually better results. This upgrading of drying oils is an important reason why use of Dow Vinyltoluene can result in better paints and varnishes at lower cost.

These better characteristics include: easier application . . . retention of higher gloss . . . better adhesion . . . greater permanence . . . low color . . . and quick drying.

Take advantage of the economical route to higher quality protective coatings offered by Dow Vinyltoluene. Ask our nearest field office for the complete story of its possibilities.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN



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Through an exclusive process developed by CIBA Research an entirely new range of Epoxy Resins is now in full-scale commercial production. Designed to overcome the deficiencies of conventional epoxies, the ARALDITE "7000" series brings rigidly controlled uniformity to make possible consistently reliable formulations time after time.

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☐ 7083 for esters ☐ 7097 for baking finishes ☐ 7071 for room-temperature finishes.

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In Mexico: **CIBA de Mexico, S.A.,**
Calz. de Tlalpam No. 1779, Apartado Postal 10262, Mexico 21, D.F.

Not wind, nor rain, nor hail, etc.... troubles the "Sheriff's Navy," protected with Cargill Polyurethane 101

Sheriff Ed Ryan of Hennepin County, Minn., maintains a fleet of volunteer craft to patrol the busy channels and traffic lanes of fabled Lake Minnetonka. This "Sheriff's Navy" is an all-weather operation, in service day and night from early Spring to late Fall, and patrol boats such as this 21 foot inboard runabout take plenty of abuse from the elements, as well as the wear and tear of constant handling.

Polyurethane 101 a proven marine finish

In April, 1958, the decks, sides and superstructure of this patrol boat were finished with 3 coats of Cargill Polyurethane 101, an oil modified polyurethane which is stable and provides the solubility, compatability and film forming qualities the paint formulator needs.

Seven months of demanding service failed to produce a fault in the finish. There was no blistering, abrasion, checking or cracking, loss of gloss, whitening or lifting. Polyurethane 101 is a product of Cargill research. For detailed specifications, suggested formulations or uses, write:

Cargill, incorporated

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basic supplier to the coatings industry

Celanese Normal Propyl Alcohol

Lets you get rid of RED LABELS

Celanese normal Propyl Alcohol has a flash point well above red label regulations! Yet it also has solvent properties equivalent to ethanol, methanol and isopropanol!

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Heliogen Viridine Y marks the first major expansion of the phthalocyanine spectrum since its introduction. This is the yellowest green pigment available for producing vivid, lightfast, non-dichromatic shades in all depths in plastics, inks, paints and textile printing.

Heliogen Viridine Y has very high tinctorial strength and is stable to organic solvents, acids and alkalis. It is additionally versatile because of the many forms available to fit your needs: toners, lakes, dispersed powders, water dispersions, pastes, presscakes.

Be among the first to use this exciting new color. Write direct or call your GDC representative for information and samples.

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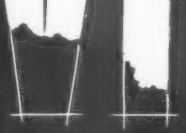
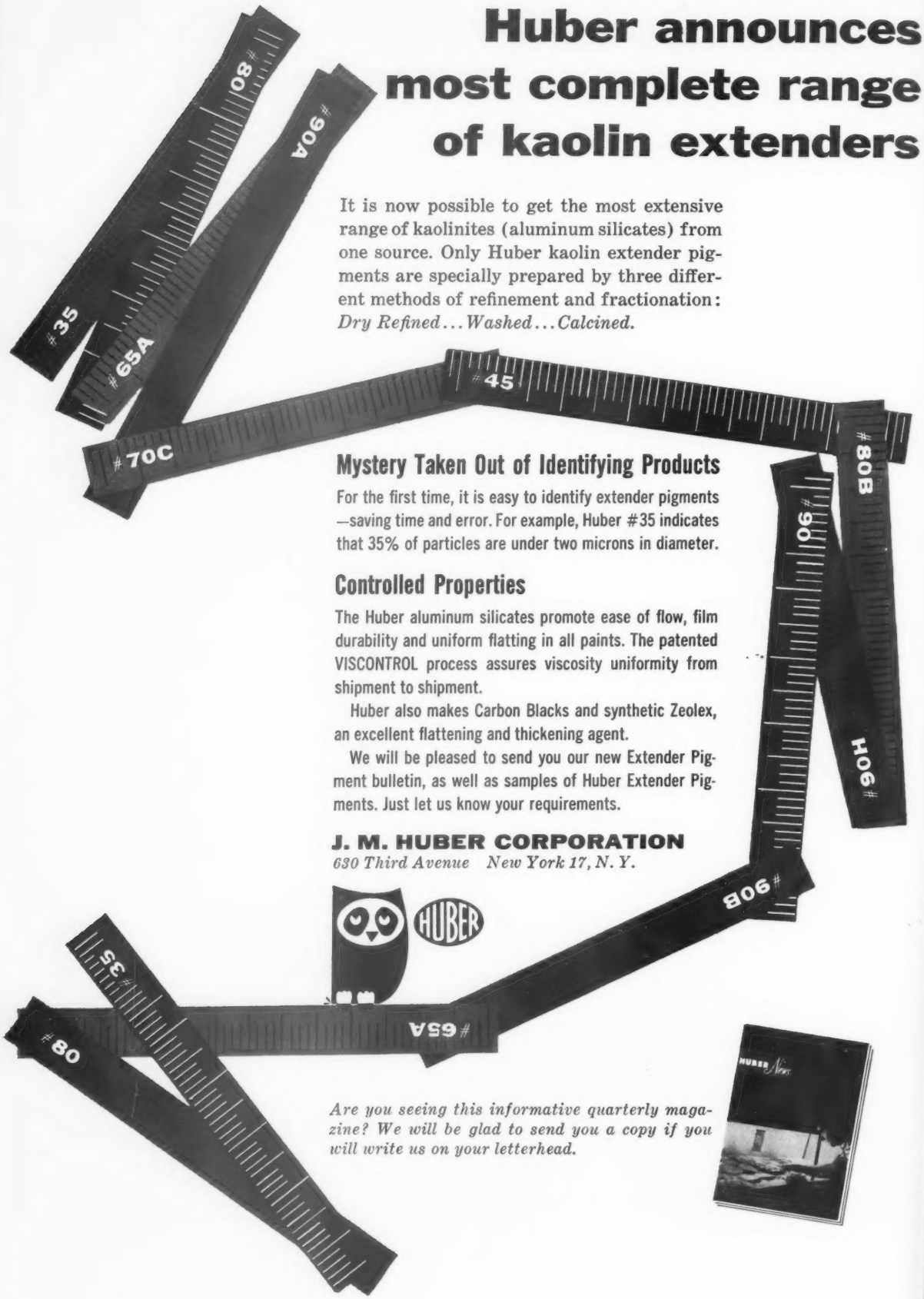
NEW HELIOGEN® VIRIDINE Y



Huber announces most complete range of kaolin extenders

It is now possible to get the most extensive range of kaolinites (aluminum silicates) from one source. Only Huber kaolin extender pigments are specially prepared by three different methods of refinement and fractionation: *Dry Refined... Washed... Calcined.*



Mystery Taken Out of Identifying Products

For the first time, it is easy to identify extender pigments —saving time and error. For example, Huber #35 indicates that 35% of particles are under two microns in diameter.

Controlled Properties

The Huber aluminum silicates promote ease of flow, film durability and uniform flatting in all paints. The patented VISCONTROL process assures viscosity uniformity from shipment to shipment.

Huber also makes Carbon Blacks and synthetic Zeolex, an excellent flattening and thickening agent.

We will be pleased to send you our new Extender Pigment bulletin, as well as samples of Huber Extender Pigments. Just let us know your requirements.

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HUBER

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TRIBUTYL PHOSPHATE

outstanding anti-foam agent

for synthetic latex paints

Adding as little as 1% of Tributyl Phosphate effectively reduces foam during manufacture, can-filling, and application. Greatly improves brushability and leveling characteristics.

for paper manufacture

Because of its exceptional cost-efficiency value and minimal residual odor, Tributyl Phosphate is the preferred anti-foam agent in paper manufacture. A minimum of the chemical remains in the finished product, with no residual odor.

For water adhesives, casein solutions, inks, textile sizings, detergent solutions, Tributyl Phosphate again offers unusual anti-foam values. Only extremely small amounts, in the range of 0.01-0.1%, are required for successful foam control.

PHYSICAL PROPERTIES

Tributyl Phosphate is an odorless and colorless liquid, is miscible with most common organic solvents, and is a good solvent for a variety of other materials. It has a surprisingly low melting point for such a high-boiling liquid.

Molecular Weight:	266.316 (calc.)
Boiling Point at 27 mm:	177°C-178°C
Freezing Point:	<—80°C
Density at 20°C:	0.982
25°C:	0.978
Weight per U.S. Gallon at 68°F:	8.19 lb.
Coefficient of Expansion:	0.00093 per 1°C
	0.00052 per 1°F
Refractive Index, n_D at 20°C:	1.424
25°C:	1.422
Viscosity at 25°C:	3.41 centipoise
85°F:	38.6 Saybolt seconds
Latent Heat of Vaporization:	55.1 cal/g
Specific Heat	0.43 cal/g
Dielectric Constant at 30°C	7.97
Flash Point, Cleveland Open Cup:	249°F
Solubility in Water at 25°C:	6.55% by volume
Solubility of Water in Tributyl Phosphate at 25°C:	<1% by volume

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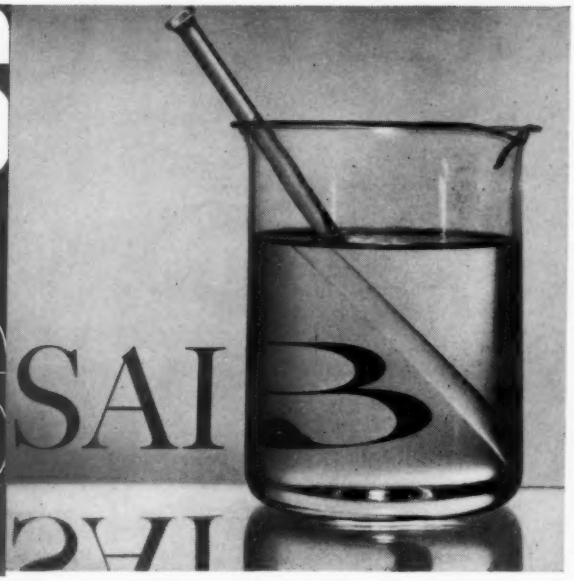
COLORLESS

at the start

COLORLESS

in the finish



Sucrose Acetate Isobutyrate, new resin modifier-extender, exhibits low color *and* excellent color stability

Sucrose Acetate IsoButyrate (SAIB) is an unusual compound of immediate interest to all who are concerned with the formulation or performance of protective coatings.

Consider these characteristics:

Its color and clarity are a sparkling water-white.

Its color stability on exposure to ultraviolet light is excellent.

Its color stability on prolonged heating is excellent. Example: samples heat-aged 6 days @ 350°F showed only a 9 Gardner color change, from 1 to 10.

Its color stability in the presence of other lacquer ingredients is excellent. Example: in metallic pigmented lacquers, SAIB does not produce a "greening" effect with bronze powder.

Lacquer film formers may be highly modified with SAIB and still show unusually good film tensile properties and hardness. The low solution viscosity of SAIB permits formulation of high-solids lacquers at application viscosities. Higher non-volatile content results in greater coverage per gallon of lacquer and reduced solvent requirements. Formulas are often simplified, too, through replacement of several lacquer-modifying components with SAIB. Film adhesion and permanence is improved in many cases.

To see how easy SAIB is to use, and how little it affects film properties while significantly increasing solids content, simply add it to your present lacquer—try 5 to 10% by volume of total lacquer to start with—spray it, and observe the result.

SAIB has been evaluated in standard formulations for melt coatings, for wood lacquers, paper coatings, cloth coatings, metal lacquers and lacquers for plastics.

For example, nitrocellulose *wood lacquers* containing SAIB show an unusually high film hardness, even at high modification. In Half-Second Butyrate coatings its presence gives an unique visual depth of finish. In *paper coatings*, its use results in very high gloss and good adhesion. In *cloth coatings*, abrasion resistance and appearance are improved. The freedom of color of SAIB is often a distinct advantage in formulating *lacquers for plastics*. In *vinyl and acrylic solutions*, replacement of part of the film former with SAIB improves sprayability and decreases cobwebbing. In *hot melt coatings*, SAIB greatly extends the basic film former.

Few commercial compounds so high in molecular weight display so compact a structure. The outstanding stability of SAIB is attributed to this dense molecular configuration.

Another unusual property of SAIB is its extremely high viscosity at room temperature and sharp decrease in viscosity with addition of heat or solvents. At 30°C, its viscosity is about 100,000 centipoises. At 100°C, the viscosity drops to 90 centipoises. A 90% solution of SAIB in Tecsol®, Eastman proprietary ethyl alcohol, exhibits a viscosity of only 750 centipoises at 30°C.

For handling convenience, SAIB is sold both as a 90% low-viscosity solution, designated *SAIB-90*, and in the 100% unmodified form, designated *SAIB*.

Many other coatings applications for SAIB are being investigated by our Customer Service Laboratories. May we help you evaluate this unique material? For this service or for a sample of SAIB, write to Chemical Sales Development Department, Chemicals Division, Eastman Chemical Products, Inc., Kingsport, Tennessee.

SAIB

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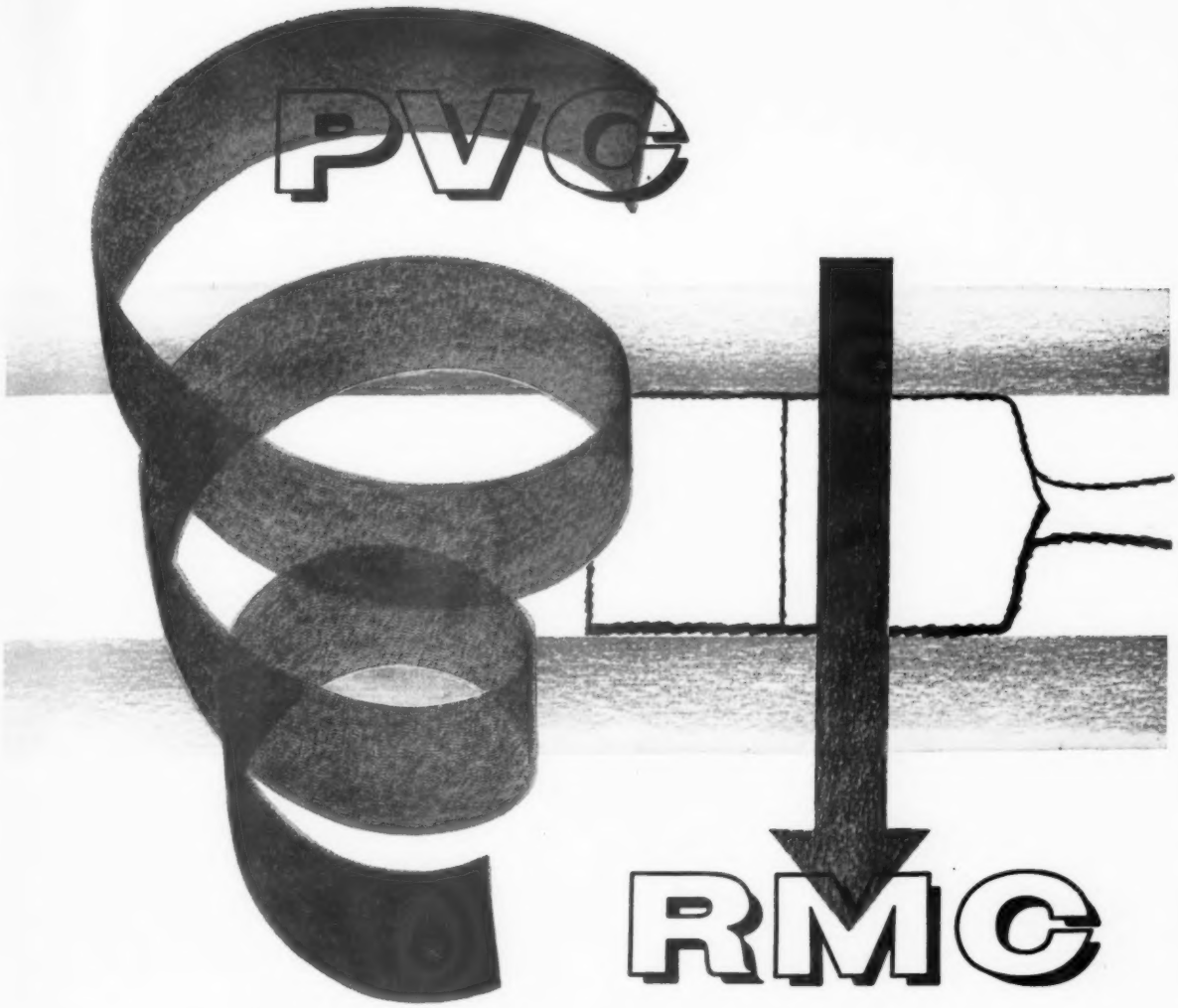

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High PVC paints based on GELVA TS-31 are in commercial use and have been proved superior in hide, leveling, color acceptance, color uniformity, brushability and other properties. With Shawinigan's GELVA TS-31, as with no other emulsion, you can produce low cost, high quality polyvinyl acetate interior paints suitable for do-it-yourself and contractor lines.

The development of GELVA TS-31 emulsion is another graphic example of how Shawinigan's unsurpassed emulsion technology is at work for you. For working formulations and technical information write to Shawinigan Resins Corporation, Department 2204, Springfield 1, Mass.

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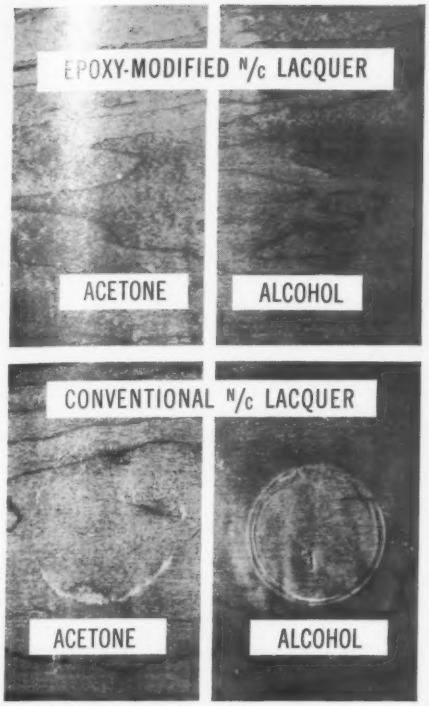
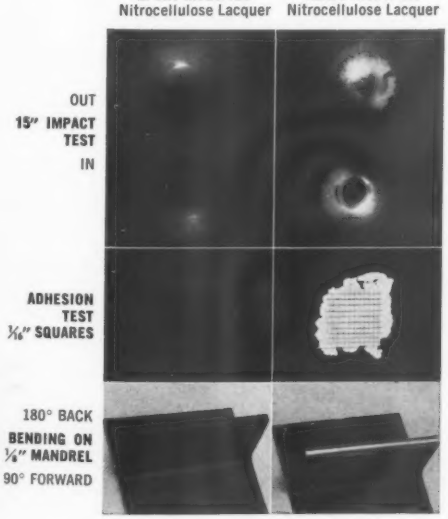


These panels, subjected to identical treatment, show the resistance of epoxy-modified nitrocellulose lacquer to spills of alcohol or acetone (nail polish remover).

Du Pont shows you how to give nitrocellulose lacquers 9 lives

by adding the chemical resistance of epoxies

On Unprimed Aluminum, tests show the superior adhesion and durability of epoxy-modified nitrocellulose lacquer (below) made by new technique.



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You can produce pigmented as well as clear lacquers which can be used to brush, spray, or dip woods and even unprimed metals.

The opportunities presented by this development are large. The information you need to make a decision about your own lacquers has been put into two bulletins by our Sales Development Laboratory. For copies, write to Du Pont Explosives Department, Wilmington, Delaware.

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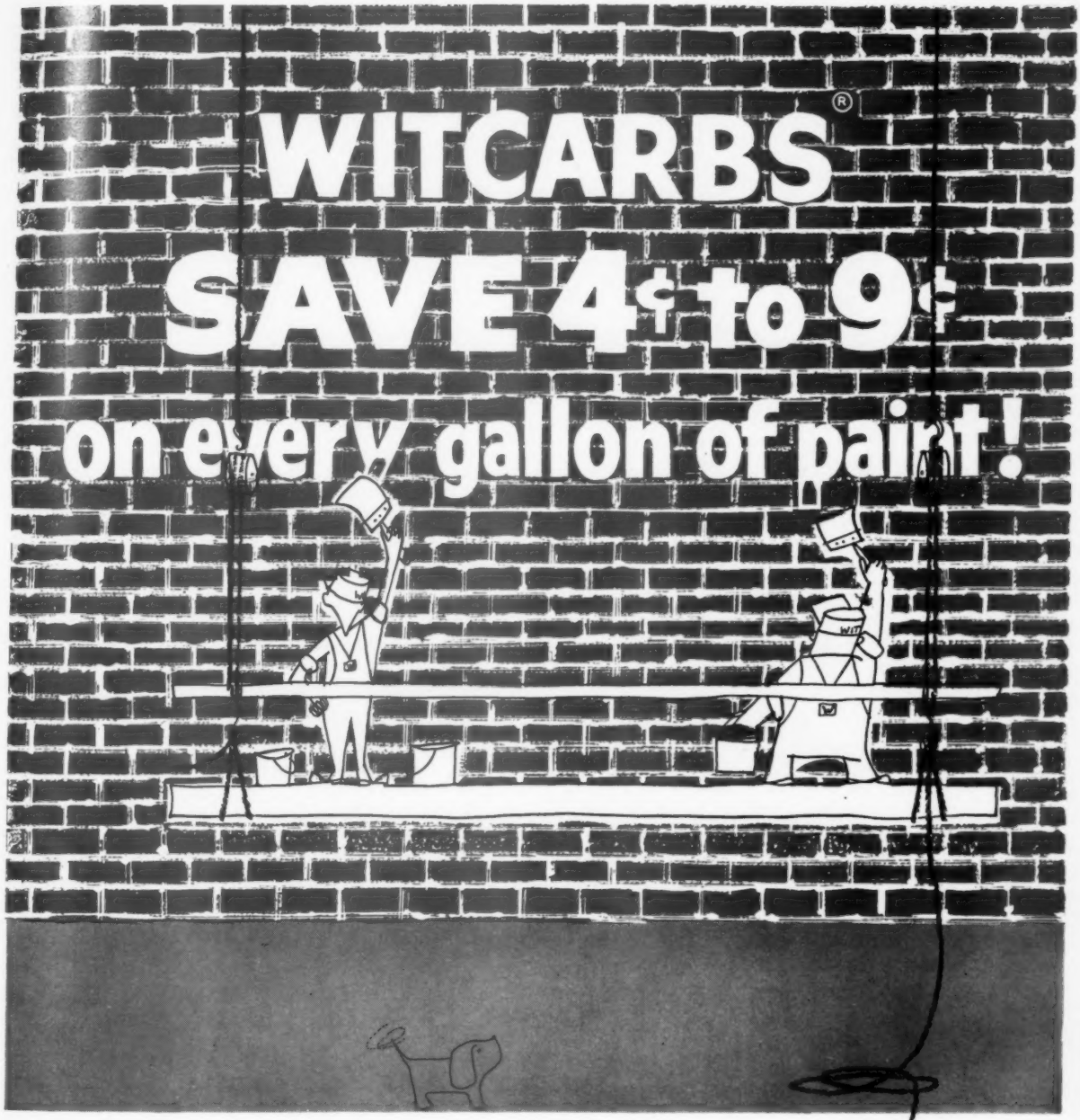

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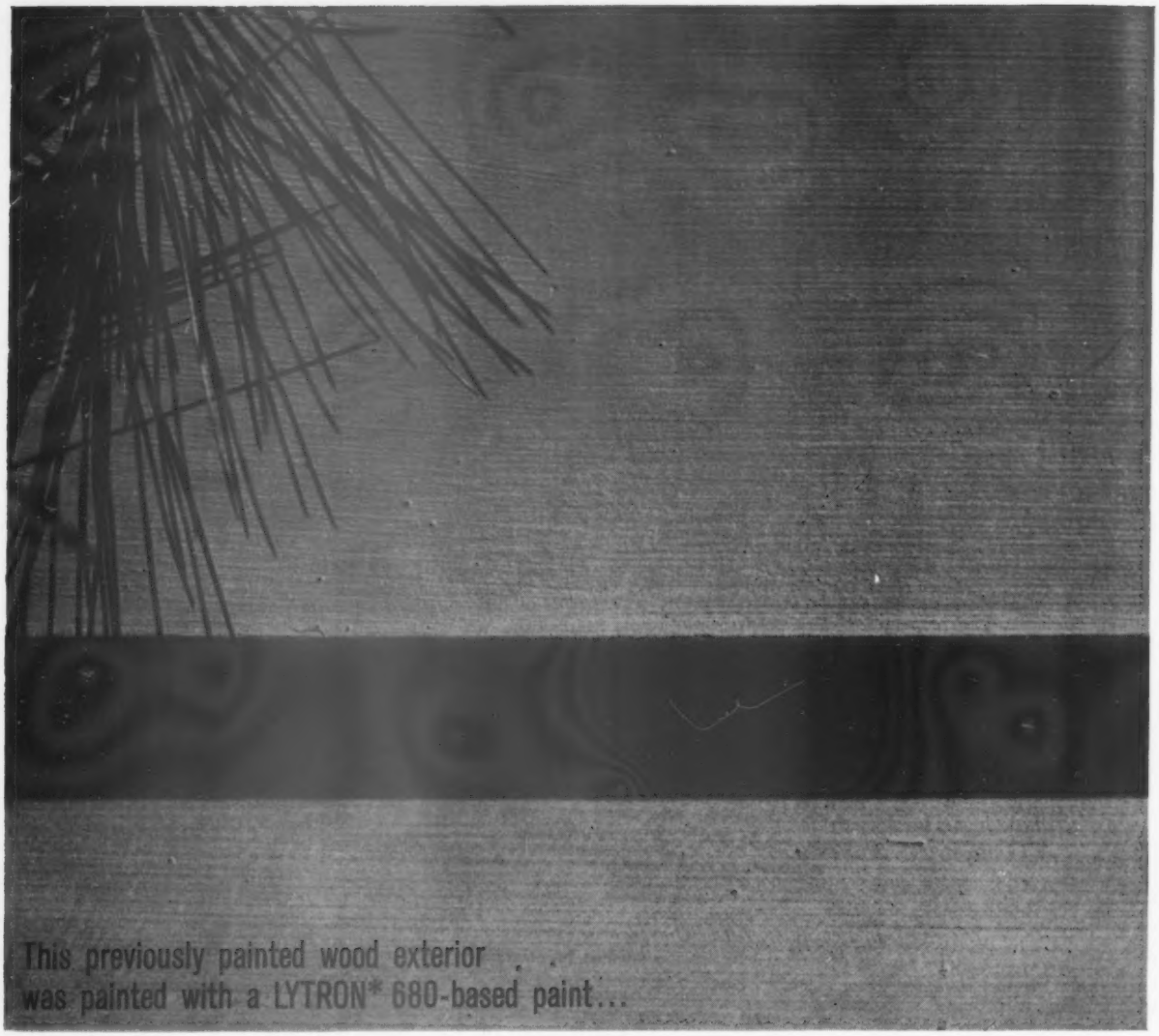

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THE ALKYD COMPOSITION GRAPH AND ITS APPLICATIONS

By
Dr. William M. Kraft*

IN any coatings system, the correct ratio between maximum economy and maximum quality is a prime factor, particularly in today's highly competitive coatings market. For this reason, the formulation of alkyd resins for a particular coating application, with specific requirements of performance, viscosity, and solvent, has attracted much interest and attention.

A solution to this problem is that described recently as the "Molecular Approach to Alkyd Structure"[1]. Briefly, this approach is based on the theory that in a reaction between the diacid and polyol, the desired fundamental structure of an alkyd resin is based on *the linear polyester sufficiently modified with a monobasic acid to prevent gelation.*

This concept can be reduced to a simple graph, not only to define the limits of an alkyd formulation for a chosen application, but also to demonstrate several new approaches to the improvement of alkyd quality. Thus, maximum quality in the system, commensurate with maximum economy, might be achieved more readily.

Pictured in this graph, Figure 1, is the formulation of alkyds from:

a) diacids, such as phthalic or isophthalic;
b) polyols, such as dipentaerythritol, pentaerythritol, and trimethylolethane; and
c) monobasic acids such as tall oil fatty acids.

One principal fact underlies the graphical representations: the three fundamental components, *diacid*, *polyol*, and *monoacid* are interrelated and must be used in quantities that will produce a gel free resin. *These specific quantities have been experimentally determined by laboratory preparations.*

The areas of gelled and non-gelled resins are divided by the gel curve. The relative position of a point on the graph defines composition completely either above the curve, indicating gelation, or below the curve, indicating gel free systems.

In particular, the systems based on pentaerythritol- and trimethylolethane-phthalic combinations are usually within the area of a dibasic acid/polyol molecular ratio of 1/1. In fact, calculation of the formulations of a large number of commercial resins has shown that the majority of better quality vehicles are actually within this range. The theory then appears to be confirmed by practice.

In systems based on isophthalic and other dibasic acids, such as adipic, the molecular ratio is somewhat lower, in the range of 0.9/1 (diacid/polyol). The disparity in the quantities of diacid might arise from several factors: greater amounts of cyclic esters with phthalic; greater functionality in its condensation polymer reactions by isophthalic; greater linearity in the polymer backbone with the isophthalic. The relative contribution of each of these factors is difficult to assess, but each may have significant effect on the physical and performance properties of the resins.

SPECIFIC FORMULATION FACTORS

The final choice of a formulation for a particular application depends on a variety of factors. These include cost, type of cure (air dry or bake), use of modifying resins (amine, phenolic, etc.), and performance qualities: hardness, speed of dry, resistance to heat, water, chemicals, outdoor exposure, etc. In many cases, the particular end use may also define the solvent and viscosity.

The actual experimental conditions for the determination of the gel curves in Fig. 1 was as follows:

1. All resin preparations were made by a *solvent type cook* to avoid abnormal loss of ingredients, particularly the diacid. To duplicate results with fusion processing, an excess of diacid must be charged to compensate for the material

*Head of Application Laboratory, Heyden Newport Chemical Corp., Garfield, N. J.

The slide rule offered by Heyden Newport for alkyd formulation is based essentially on the features discussed in this paper.

losses incurred by sparging and inert flow. This excess should be equal in weight to that lost.

2. *Tall oil fatty acids* were used in the procedures. These products, under the reaction conditions, show little tendency to heat polymerize. The results are similar to those normally obtained with saturated acids, cottonseed fatty acids, and soy fatty acids. More highly reactive acids obtained from linseed, dehydrated castor, or safflower oil show gelation curves somewhat lower placed on the graph than those indicated.

3. *The esterification temperature* of 245° C. (473° F.) is commonly used in industry. A lower temperature of 210° C. (410° F.) results in a higher displaced gelation curve, presumably because the polymers formed have less crosslinks and more linearity.

4. *The final acid numbers* of the resins were all within the range 10 ± 1. A higher range has the effect of raising the position of the gelation curve.

Factors 2,3, and 4 may have a cumulative effect. The net effect then depends on the relative magnitude of each.

Applications

The use of this approach to resin formulation can be invaluable in guiding specifications for a variety of resins finding application in many different coating systems, including architectural finishes, flat wall vehicles, product finishes, and appliance and automotive finishes.

Architectural Vehicles

Long Oil Pentaerythritol Tall Oil Fatty Acid—Normal usage calls for a vehicle, diluted in mineral spirits or similar solvents, with a viscosity of U-Z_2 at 50 to 70% non volatile content. Drying times of the clear films are generally within an overnight period. Durability, color and gloss, and their retention must be good. Such properties can be readily achieved by means of a tall oil fatty acid-PE-phthalic alkyd having a molecular ratio of PA/PE/FA..1.04/1/1.3.

Indeed, studies of performance (hardness, dry time, resistances) vs. composition of these alkyds have actually shown that maximum properties are generally obtained where the phthalic/polyol ratio is 1.0 and greater, and in PE alkyds where the fatty acid content is between 1.1 and 1.3 moles.

To determine composition by referring to the graph in this particular case, find the PA/PE ratio of 1.04 on the ordinate and go to the right until 1.3 is reached on the abscissa. This point is now seen to be below the gelation curve related to PE-PA. Therefore, it is a cookable resin. Actual preparation of this resin by a solvent process would use the following quantities (moles x molecular weight = parts by weight):

1.04 moles phthalic anhydride	1.04 x 148 = 153.8
1 mole Pentek	1.00 x 145 = 145
1.3 moles Aconew Extra	1.3 x 287 = 373

Processing at 245° C. to an acid number of 10 would provide a resin having a viscosity of U at 60% N.V. in mineral spirits.

Where fusion type equipment is used, the phthalic content must be increased to offset the losses normally met in this procedure. If the phthalic loss were 5% based on the phthalic charged, then in the above formulation 1.05 x 153.8 = 161.5 parts of phthalic would be used in the initial charge.

Long Oil PE Tall Oil Fatty Acids—High Polymer Technique Alkyd—In order to obtain more rapid drying rates, better resistances and improved performances, the High Polymer Alkyd Technique has been finding increasing usage. The alkyd gelation curve is particularly useful in establishing the proper level of initial esterification. This will be illustrated for two compositions:

a. 52R13 Type Resin—In order to obtain a viscosity of X-Z at 60-70% N. V. in mineral spirits, a common choice has been a soy oil-PE phthalic resin of about 65% oil length (>23% phthalic content). These physical properties are achievable with a tall oil fatty acid PE alkyd with a molar ratio of PA/PE/FA = 1.035/1/1.4 made by the High Polymer Technique.

After locating this point on the graph, the correct level of initial esterification may be found by drawing a line parallel to the abscissa through this point. Note that its intersection with the gel curve is at 0.9 moles of fatty acid. However, to provide sufficient leeway to avoid premature gelation in the initial esterification or shortly after the second portion of fatty acid is added, assume that the lowest value for gelation is 0.98 moles. The correct level of initial esterification is then 0.98/1.4 = 70%.

The actual formulation and procedure are:

1.035 moles phthalic anhydride	= 1.035x148 = 153
1.0 moles Pentek	= 1.04 x145 = 145
0.98 moles Aconew	= 0.98 x287 = 281

Cook at 210° C. to an acid number of 10, then add 0.42 moles Aconew 0.42 x 287 = 120.7 and process at 245° C. to an acid number of less than 8. The viscosity is X at 60% solids in mineral spirits. The temperatures indicated above have been shown to provide maximum dry and resistance qualities.

Again the processing of this formulation in fusion kettles will require the use of a slightly greater amount of phthalic anhydride to compensate for that lost through gas entrainment, volatilization, etc.

b. Long Oil Resin for House Paint and Latex Resin Modification—For these applications a resin having a viscosity in the range of Z-3 to Z-6 at 100% N. V. is frequently desired. These characteristics can be met with a resin having a PA/PE/FA ratio of 1.0/1.0/1.8, again prepared by the High Polymer Technique.

Find the point referring to this resin on the composition graph. Draw a line parallel to the abscissa through this point until it intersects the gel curve at 0.8 moles. Again, to provide leeway and safety in processing choose the lower limit as 0.9 moles. The optimum initial esterification level is then 0.90/1.8 = 50%.

The actual formulation and procedure are:

1.0 moles phthalic anhydride	= 1.0x148 = 148.9
1.0 moles Pentek	
0.9 moles Aconew	= 0.9x287 = 259

Cook at 210° C. to an acid number less than 10 and add

0.9 moles Aconew	= 0.9x287 = 259

and cook at 245° C. to an acid number less than 8.

It is not necessary to calculate for excess hydroxyl in this method, since it is usually dependent on the

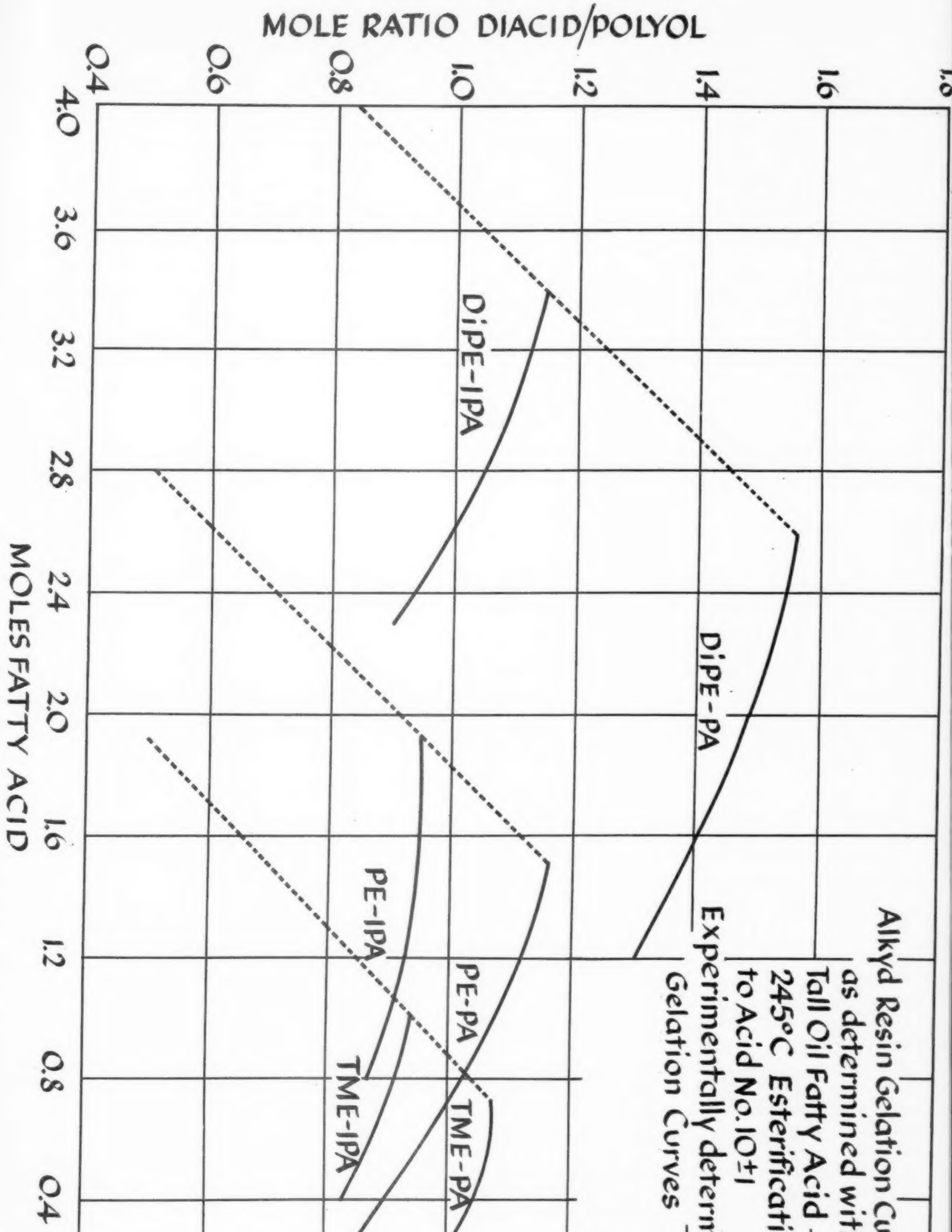

MOLE RATIO DIACID/POLYOL
0.4
0.6
0.8
1.0
1.2
1.4
1.6
MOLES FATTY ACID
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0
DiPE-IPA
DiPE-PA
PE-IPA
PE-PA
TME-IPA
TME-PA
Alkyd Resin Gelation Curves
as determined with
Tall Oil Fatty Acid
245°C Esterification
to Acid No. 10±1
Experimentally determined
Gelation Curves

Figure 1.

particular application's requirements and not by personal choice.

The use of the High Polymer Technique also finds use with TME medium and short oil resins which can be formulated as above.

Flat Wall Vehicles

High viscosity at low solids content in a particular low solvency thinner is a desirable characteristic of flat wall alkyds. Together with low penetration and good performance qualities including quick drying and resistance to alkalies and detergents, this may be accomplished by an alkyd having a low fatty acid content with Pentek as the polyol. The type of diluent used determines the actual fatty acid level. Thus for a system diluted with odorless mineral spirits, an alkyd of molar ratio of PA/PE/FA = 1/1/0.9 provides a viscosity of V-X at 30% N. V. This composition is below the gel curve and, therefore, is cookable at 245° C.

It should be noted that higher viscosities are obtained at the right hand portions of each of the individual graphs since these represent the vehicles of lower fatty acid content, and, therefore, lower oil length or greater phthalic content.

Another flat wall vehicle, but this time diluted in regular mineral spirits, may be obtained by taking a molecular formulation of PA/PE/FA = 1/1/0.6. In terms of the graph, this is above the gel curve for PE-PA systems. However, since the gel curve was determined by processing at 245° C., an effective means of displacing the gel curve to a higher position, and therefore to avoid gelation, is to process at 210°C. The use of the lower temperature reaction results in less crosslinking thereby forestalling gelation.

For a flat wall alkyd dispersed in low odor mineral spirits, the correct viscosity is obtained with the molecular ratio PA/PE/FA = 1/1/0.7 with processing at 220° C.

Product Finishes

Medium Oil Resins—A common choice for product finishes is a medium oil resin with a phthalic content of about 35%. In terms of the Molecular Approach, this would be a resin based on PA/Polyol/FA = 1/1/.7 where the polyol is trifunctional.

Desirable performance qualities in air dry and baking uses can be achieved easily through the use of PE-glycol resins providing two factors are considered: correct formulation, i.e., the ration of PE to glycol; and minimizing glycol losses in the processing of these resins.

The formulation may be derived with the aid of the composition graph by assuming that the resin is actually made from two separate components, a phthalic-PE-fatty acid resin and a phthalic-glycol polymer.

A formulation of 1/1/1.4 for the PE alkyd portion is a good choice since it has a PA/PE ratio of 1/1 and it is within the non gel area. The formulation of the glycol polyester at a PA/glycol ratio of 1/1 should provide maximum linearity, freedom from seeding and gelation on addition of driers.

If now one part of each resin is taken, then the sum is:

PA/PE/FA = 1/1/1.4
PA/glycol = 1/1

PA/PE-g/FA = 2/1-1/1.4 or by dividing by 2
= 1/.5-.5/0.7

Thus the vehicle could be made by charging:

1.0 moles phthalic anhydride = 1.0 x 148 = 148
0.5 moles ethylene glycol = 0.5 x 62 = 31
0.5. moles Pentek = 0.5 x 145 = 72.5
0.7 moles Aconew = 0.7 x 287 = 201

to the kettle.

In processing, losses can be kept to a minimum without steam condensers and specially designed recovery systems, by using a time-temperature schedule.

Heat to 150° C. and hold for ½ hour.
Heat to 190° C. and hold for 1 hour.
Heat to 245° C.

If the processing is in a solvent system, then at this point *and not before* add sufficient solvent for reflux. Continue processing at 245° C. to an acid number of less than 10. The viscosity is W at 60% N. V. in M. S. In a fusion cook, however, greater glycol losses are encountered than with the solvent method.

In a procedure variation offering somewhat better alkali resistance properties but similar viscosity and dry rates, one mole of phthalic anhydride is reacted with the half mole of glycol at 150° C. before the addition of the other ingredients. The rest of the processing is by the above described conditions.

Another medium oil vehicle with excellent color and gloss retention, heat stability, alkali, and detergent resistance can be formulated with trimethylolethane as the polyol and tall oil fatty acids.

A molecular ratio of PA/TME/FA = 1/1/.6 would provide a typical formulation for use in this area of application. The procedure for the resin would be:

1.0 moles phthalic anhydride = 1.0 x 148 = 148
1.0 moles TME Technical = 1.0 x 124 = 124
0.6 moles Aconew = 0.6 x 287 = 172.5

Cook at 245° C. to an acid number of 10 or less. The viscosity is X at 60% N. V. in xylol.

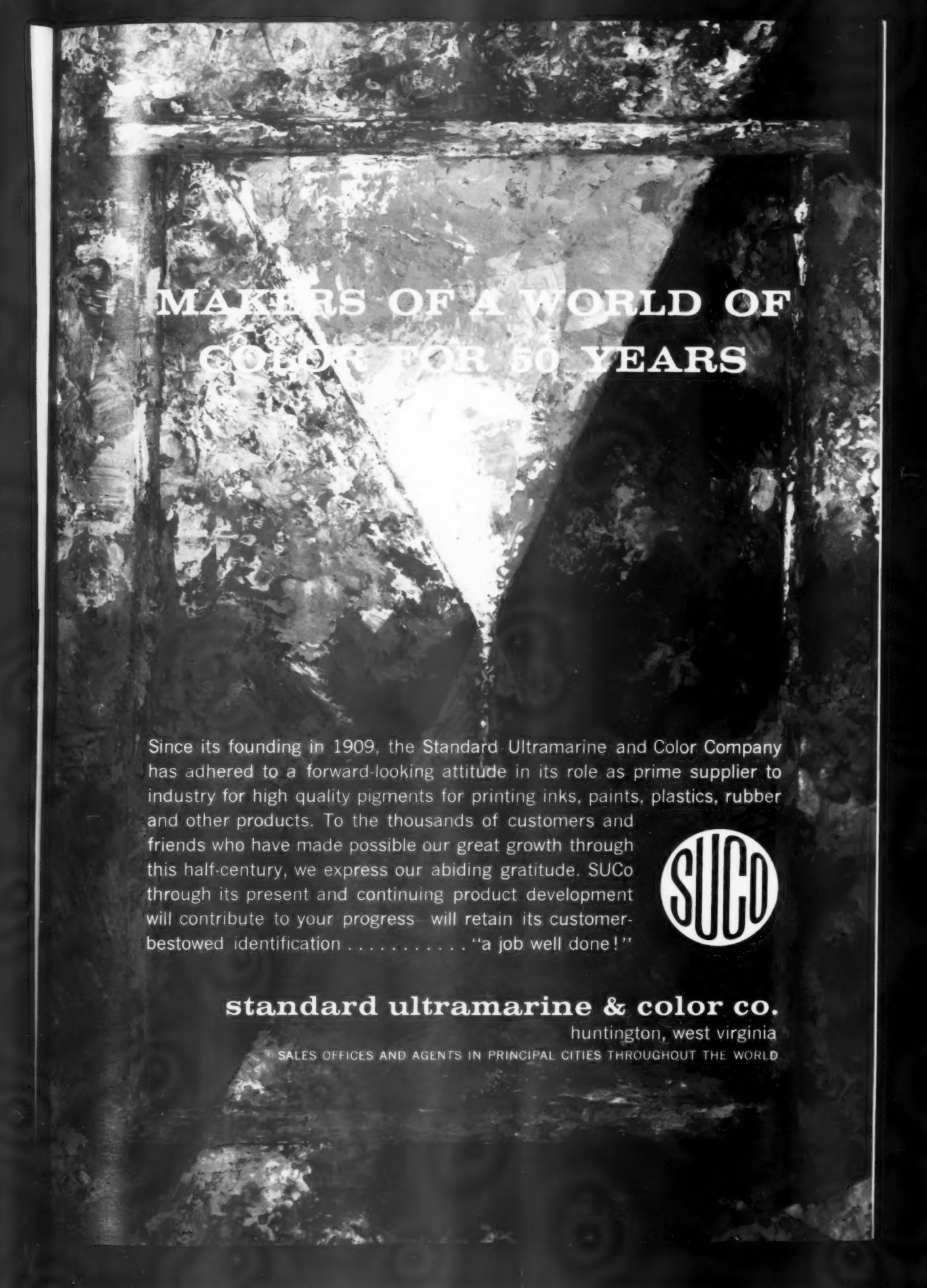
The High Polymer Alkyd Technique is applicable to examples 1 and 2 if improvements are desired.

A short oil resin also based on TME and tall oil fatty acids can be formulated at a molecular ratio of 1/1/.5. Note that this is below the gelation curve for TME-PA. As a matter of significance, TME resins can be processed at fatty acid levels as low as 0.25 moles. This enables higher phthalic content resins with resulting greater hardness and faster dry.

As a reference guide to correlate fatty acid and phthalic content (assuming PA/TME = 1.0) the following may be of value.

Moles Fatty Acid (Mol wt. 280-287)	% Phthalate Content
0.8	32
0.7	34
0.6	36
0.5	38
0.4	41
0.3	45
0.25	46.5

(*Turn to page 83*)



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BASIS OF ENTRY – These awards are open to any individual in the United States or Canada engaged in research, either in industry or with government or educational institutions. Entries by research teams of two or three associates are eligible.

First consideration will be given to work which has come to a clear-cut point of accomplishment during the current year; but work carried on in previous years, the significance of which has been confirmed by commercial application in 1959, also will be eligible.

Entries will be judged by a committee of three persons of outstanding reputation and scientific background, having no connection with the Association or its members.

METHOD OF NOMINATION – Nominations must be made on the official entry blank, which may be obtained by writing to: Awards Committee, Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

All nominations for the 1959 awards must be received by November 1, 1959 to be eligible.

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Third
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1957

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Harvard Medical School

Second
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University of Rochester

Third
C. G. Youngs and Henry R. Sallans
National Research Council of Canada

1956

First
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U. S. Department of Agriculture

Second
Donald Zilversmit
University of Tennessee

Third
Stanley G. Knight
University of Wisconsin

1955

First
Reed A. Gray
Merck & Co.

Second
Eugene P. Kennedy
University of Chicago

Third
Karl H. Lauer
University of Alabama

1954

First
Robert K. Summerbell
Northwestern University and
James R. Stephens, American Cyanamid Co.

Second
Two research teams:
Robert W. Swick and Akira Kakao
of Argonne National Laboratory and
Harland G. Wood and Per Schambye
of Western Reserve University

Third
Henry A. Sloviter, University of Pennsylvania

1953

First
Erich Baer, University of Toronto

Second
Lewis I. Gidez
Brookhaven National Laboratory and
Manfred L. Karnovsky
Harvard Medical School

Third
Albert C. Nuessle, Rohm & Haas and
Russell F. Crawford, Jr., Sharon Hill, Pa.

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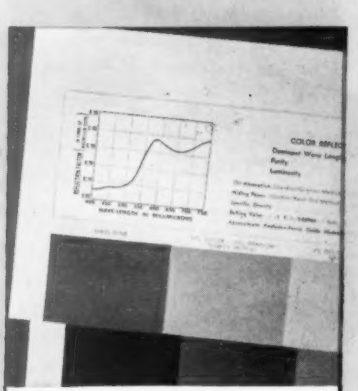

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CAN THE PAINT INDUSTRY PROFIT BY MARKET RESEARCH?

By
Jay R. Willner*

What answer does this question indicate? We all have a fairly consistent picture of the paint industry. But what is market research? In brief, it is a "try" at answering "questions". We say "try" because in many cases it is only that; there are no right and wrong answers, just ones more nearly correct than others. The "questions" are those not answered in books or even in your competitors' files. The answers require unemotional, unbiased, intelligent evaluations; at least as far as possible.

Field Contacts

There are several techniques used in market research. The basis of it all is an adequate and continual contact with large segments of the people in the industry and those interested in the industry. That is prettly long and involved. In short, the meat of any market research work is contacts in the field. In the paint industry this would include talking to users of paint, makers of paint, distributors of paint, paint magazines, raw material producers, industry associations, and the like The important feature is not to try to answer your questions *before* contacting all or most of the segments, nor to prejudge the information value of any one segment.

Field contacts are important, but not the only factors involved. A search of the literature can be rewarding; not only with straight information but also with people or companies to contact. Contact lists are time savers; a large measure of success of the field call depends on getting the "right" man *within* the company you are contacting. Past market research work is valuable; if it has been properly done, it can be updated with just a few key calls. Personal friends are needed; the ability to call a "buddy" and throw a key question at him can put polish on the final report. Finally, the results must be compiled in a manner conducive to management decision–making. Management should not need a chemist for translation. On the other hand, lab personnel using the report should not be bored with chemical definitions or financial implications.

In general, that is market research technique. Now, what questions can it answer for the paint industry? For a clearer picture, we have split the surface coatings industry into Trade-Sales and Industrial-Sales.

Industrial Sales

In Industrial-Sales, let us take, for example, a white baking enamel.

The first question one might answer with market research is: What is the total current industry production? That is, try some way to fix the total market demand and the past growth pattern. This should include imports and exports.

Second question: Who produces such an enamel and what is the total capacity? This would be a tough one for white baking enamels because almost everybody is capable of producing one kind or another. The capacity could vary over a wide range because of multiple use of production equipment.

Third question: What are the end-uses of this enamel? Does it go mainly on water heaters, washer-dryer combinations, refrigerators, metal kitchen cabinets, or what? We try to pin down the current end-use pattern and if it is changing.

Fourth question: What trends are "working on" the current consumption pattern? Are price and durability big factors in deciding what paint to use or even what type of surface to use? Or are warehousing, credit, and type of container important? Or are the method of application and technical service determining?

This is the crux of a market research study. Current trends can only be measured by widespread contacts with people in the field. The questions above are quite general; more specifically, we might ask: Would a two package system be objectionable? Does using water as a solvent *really* lower insurance rates? Or does it result in a lower painting cost per unit of production? Does the painting cost per finished unit of production determine choice of the paint used? Or is price per gallon a factor? To repeat, this is the kernel of market work.

Finally, what will the end-use breakdown look like three years hence; five years hence? How will the trends examined above affect the current consumption pattern?

*Roger Williams, Technical & Economic Services, Inc., Princeton, N. J.

This is where we make a forecast.

These are some of the questions market research can answer for Industrial-Sales coatings; to be sure, some with more reliability than others.

In short, we have estimated current consumption, examined the trends affecting current consumption, and applied these trends to forecast future consumption.

Trade-Sales

For Trade-Sales, the technique is the same but the questions are quite different. After all, these are like two different industries. Many firms are engaged in both Trade-Sales and Industrial-Sales but none use the same personnel nor the same sales or production philosophy.

Here, as an example, let us take an interior flat wall finish.

The first question which arises involves again overall current industry production. We could take the industry apart in several ways depending in what we are interested. If it is distribution channels, we would try a residential versus non-residential breakdown. If it is emulsion systems, we would attempt a masonry versus wood versus all other substrates, or an interior versus exterior classification. A lot of time and effort can subsequently be avoided by doing a comprehensive job here.

Second question: What is the consumption-capacity relationship? Who produces what and how much can they produce? These would be tough to pin-point, again equipment can be used on various type paints.

Third question: What are the trends? Not only is it important to look for paint trends, but also paint competitor developments—wallpaper, plastic, aluminum. Will the exterior emulsion problems be solved? What is the movement in fungicides and mildewcides? How about spray application for Trade-Sales paints? Is it gaining? Is it more readily accepted by the unions? These are obviously the heart of the study.

Finally: *What will the future be like?* This forecast will be a considered amalgamation of all the information on hand, a best efforts refinement of much qualitative data.

There is no doubt that the up-to-date answers to many of these questions would be highly worthwhile in the hands of management. It is also clear that many of these questions are only answerable in very general terms. We say that management has to weigh the cost of getting any answers against what they are worth in increased profits.

What Method?

There are two more points to be discussed. Who should do the market research and how much does it cost?

Most firms do market research whether they know it or not. Much is on an informal, seat-of-the-pants basis. In some cases this is adequate, in most entirely not. The object of setting up some kind of semi-formal operation (even a one man department) is not to see how close forecasts come to the actual figures. The main benefit from market research lies in using the trend information to weight research and sales programs.

As a simplified example, suppose the consensus of field contacts indicated a two-packaged industrial finish was feasible, offered desirable properties, and could be produced for only a slight premium, but that industrial users were unconvinced or leary. It follows that management should direct research effort on improving application techniques and point sales effort to the plant manager.

As another example, suppose field work indicated that long range trends of improved durability, fewer coats, and unpainted substrates will greatly restrict the growth of exterior architectual finishes. In other words, gallonage sales will not be materially higher five or ten years from now in spite of the increased houses built or more frequent repaintings for esthetic reasons. Assume it also showed that home owners are doing more and more of their own painting, both inside and out.

It seems logical, barring any other major findings to the contrary, management should foster this do-it-yourself development in their sales promotion, also work toward products which are more "foolproof" and can be used by anyone.

Who can best do market research work? Many firms do excellent jobs with their own market research departments. But such departments should always be isolated from salesmen or sales organizations. Optimism is desirable in a salesman; market research demands as much realism as possible. The two should not be mixed. This is where the private market research organization has an advantage. While it is possible to build company market research departments with an acceptable minimum of prejudice, the outside consultant has no conceivable axe to grind.

This is a good spot to bring in the final point—cost. Many firms have said that market research is too expensive on the outside, much cheaper to do with company personnel. The answer to this depends on what costs are included. When proper overhead expenses like office help, library, mailing, phone calls, magazine subscriptions, and the like are added to professional salary charges, then the difference between inside and outside costs becomes quite small. That this difference is small can be seen from the following: The outside firm can spread its overhead over as many as twenty or thirty different studies at one time. Further, professional salary charges are about the same both inside and outside. For the outside firm, if we add a normal profit to the somewhat lower overhead charges and consider staff salary costs about even, then costs per study should be about the same as for similar inside work. This assumes that the market function inside a company is given its rightful place, not made a part-time operation.

On large studies we have attempted to spread the cost over many firms by developing what is called a multiple-client study.

In summing up, we can surely say that chemical market research is here to stay, both within a company and by outside firms. Growth in membership of its professional association is proof enough. Some paint firms are already using this new management tool; we feel many others could benefit from trying it.

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A Staff Report

Cyclized Rubber in Protective Coatings

Part IV

This installment concludes a discussion of the film properties of cyclized rubber coatings. Also featured in this installment is binder compositions of cyclized rubber coatings for various end use products.

FILM PROPERTIES

Humidity and Heat

The high moisture resistance makes cyclized rubber especially suitable for paints which must stand up under warm and humid atmospheric conditions and endure extreme conditions of water condensation. Such coatings can be formulated using combinations with alkyd resins and suitable plasticizers. Drying at elevated temperatures improves the resistance, and when curing temperatures of 200° C. are used, boiling water resistant coatings are obtained, providing, however, that proper vehicle composition and pigmentation is used. For the pigmentation of paints used under warm and humid conditions, the use of zinc oxide as part of the total pigment has proven itself to be advantageous.

Weather Resistance

As in any other coatings system, the weather resistance of cyclized rubber coatings depends on the composition of its binder and its pigmentation. Cyclized rubber as such is only of limited weather resistance and plastification is needed as mentioned before. Only the paints plasticized with Aroclor 1248 are fairly weather resistant. They are mostly used as high chemical resistant interior coatings. During exterior exposure over a longer period of time, a loss of gloss is observed. For severe exterior exposure application, combinations with alkyds and plasticizers are preferred.

Thermoplasticity, Heat Resistance, Flammability

Unpigmented cyclized rubber films have a certain thermoplasticity which is noticeable at elevated temperatures, especially under the action of a flame which causes melting of the film. On aging the thermoplasticity diminishes.

As mentioned before, the heat resistance of the cyclized rubber is greatly improved over the natural rubber starting material caused by the isomerization process. Cyclized rubber films start to yellow slightly at 150° C., and stronger yellowing occurs at 200° C. The excellent heat resistance is a very important property of cyclized rubber, permitting its far reaching use in industrial plants. Generally paints of normal pigmentation and proper compositions can be used under conditions up to 250° C. Special metallic paints can be used at temperatures as high as about 500° C.

The flammability of cyclized rubber is very low, because its temperature of thermal destruction is high in comparison to other binders and starts to burn only after prolonged heating. Similar results are observed when cyclized rubber films are plasticized with inflammable plasticizers. The low degree of flammability of varnishes should be also mentioned because the solvents used in the production of cyclized rubber varnishes, like mineral spirits, are slow evaporating and have a high flash point.

Electrical Properties

The electrical properties of cyclized rubber are

characterized by its very high insulating value which is hardly influenced by humidity because of the high moisture resistance of cyclized rubber. The dielectrical value lies around 1.3-1.4 depending on the drying conditions. The resistivity is in the order of 10^{16}-10^{17} Ωcm. and diminishes only 1-2 powers when immersed for 4 days in water or exposed in air saturated with moisture.

Physiological Properties

Cyclized rubber as such is physiologically harmless. If cyclized rubber based coatings of physiologically neutral properties are requested, attention should be paid to modifying agents and proper application. Wherever possible, heat curing should be preferred which improves through dry, solvent release and improves markedly the chemical resistance of the coatings.

The application of cyclized rubber paints is harmless from a physiological point as long as mineral spirits is used as a solvent, and no other undersirable materials are present.

APPLICATIONS IN SURFACE COATINGS

Recommended Applications

Based on its numerous specific properties cyclized rubber finds wide use in the paint industry. Depending, as the case may be, on properties requested, utlization of cyclized rubber can be as follows:

1. As a aliphatic hydrocarbon solvent soluble binder, drying by evaporation of the solvent.
2. As a hard resin resulting in improved drying properties of vehicles, which dry by oxypolymerization (oil and alkyd resin varnishes).
3. As a heat curing paint raw material in combination with polymerizable film formers.
4. As a highly chemical and water resistant binder.
5. As upgrading material for conventional binders, such as drying oils and bituminous products.
6. As low flammability binders for fire protective ings and high heat resistant paints.
7. As non-toxic film former for protective coatings for food containers.

Table X is a correlation of various application possibilities demonstrated by a number of examples taken from practical applications. The recommendations made in this table must be considered only as a starting point, which gives only one of the various possibilities of the binder composition.

Binder Compositions

The main interest centers around the use of cyclized rubber for chemical resistant and corrosion resistant protective coatings. The resistance requirements and other performance demands are numerous and vary from one case to the other. Besides the type and harshness of the reagent, it must be differentiated between permanent or limited time exposures: permanent exposure to liquid chemicals, and short time exposure caused by splashes, occasional overflow, various temperature conditions under simultaneous action of the surrounding atmosphere, etc. To serve the purpose best, a differentiation is made dividing the practical applications into the following four groups:

A. *High chemical resistant coatings* for inside and outside of vessels, pipelines and equipment in closed areas. The coatings are constantly exposed to the corrosive media. Outside durability is not requested.

B. *Conditionally chemical resistant coatings* for inside continuous exposure to stronger chemicals. Outside durability not requested.

C. *Chemical resistant coatings* for plants, machinery, etc. for outside exposure which are repeatedly exposed to the action of corrosive chemicals for short times. Outside durability requested.

D. *Outside durable protective coatings* for plants and steel structures in corrosive atmospheres to be protected against water, steam, corrosive gases and dust.

It is impossible to use just one paint to satisfy all the demands outlined above. Maximum suitability and high protective values of paints can only be obtained through careful formulation to suit the purpose the coating is intended to serve.

In the following paragraphs, the various possibilities to formulate suitable cyclized rubber binders are described. The division into four groups, as mentioned above, forms the basis for these considerations. Their purpose is to facilitate orientation and project a better view about principals involved in binder formulations.

As previously mentioned, cyclized rubber is hardly used as such, but almost entirely in combination with other more-or-less plasticizing varnish raw materials. The most important ones to be used for corrosion resistant coatings are:

(1) Chemical resistant plasticizers as, for example, Aroclor 1248, chloroparaffin. Diphenoxy-ethyl-formal, and plasticizing poly acrylates.

(2) Long to medium/long alkyd resins based on dehydrated castor oil, linseed oil, soyabean oil, etc.

(3) Drying oils such as linseed oil, bodied linseed oil, dehydrated castor oil standoil, bodied woodoil.

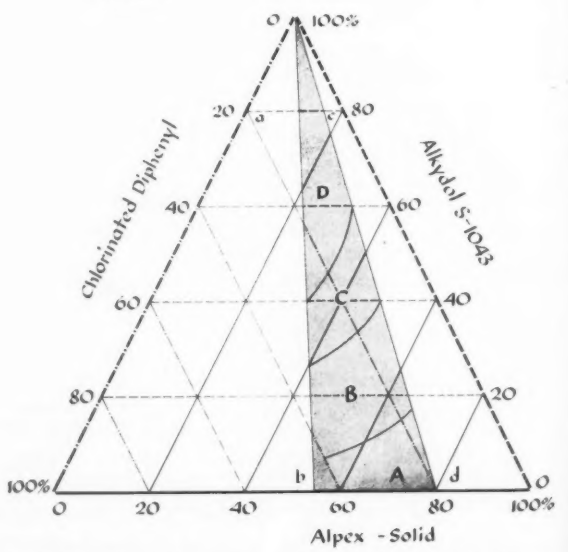


Figure 10. Possible raw material combinations for formulating cyclized rubber coatings.

Type of Paint	Suggested Binder	Drying Schedule
Alkali resistant paints	Cyclized rubber + Aroclor 1248	Air dry
Alkyd resin varnish Quick drying	Cyclized rubber + S-1107	Air dry
Cement paint	Cyclized rubber + Aroclor 1248+S-1107	Air dry
Asphalt combinations	Cyclized rubber + Asphalt	Air dry
Boat and under water paints	Cyclized rubber + Linseed standoil + Arochlor 2148	Air dry
Brewery paints	a Cyclized rubber + Aroclor 1248 (1) b Cyclized rubber + Woodoil Standoil + Arochlor 1248 (1)	Air dry
Chemical resistant coatings for tanks, apparatus, pipes and machines (Inside use)	Cyclized rubber + Aroclor 1248 (1)	Air dry
Electrical insulating Varnishes, creep resistant	Cyclized rubber + Alkydol S-1043	1 hr. – 120° C.
Electro-Impregnating	Cyclized rubber + S-1043+109-A	120: C.
Floor paints	Cyclized rubber + Oleoresinous or alkyd varnishes	Air dry
Hammer finishes	Cyclized rubber + S-1107	Air dry
Corrosion resistant paints, heat resistant	Cyclized rubber + S-1043	Air dry
Impregnating varnishes – Flame resistant for cloth coatings	Cyclized rubber + Aroclor 1248 + Chloroparaffin	Air dry
Boiling water resistant coatings	Cyclized rubber + Alkydol S-1043	I hr. – 200° C.
Corrosion resistant paints for outside, in the chemical industry and mining industries	Cyclized rubber + Alkydol S-1043 + Arochlor 1248	Air dry
Red lead primers, quick drying	Cyclized rubber + Alkydol S-1043 + Linseed oil	Air dry
Dairy paints	Cyclized rubber + S-1004-A	Air dry
Rust inhibitive paints	Linseed oil + cyclized rubber	Air dry
Wrinkle finishes	Cyclized rubber + bodied Wood oil + raw Wood oil	1 hr. – 80-90° C.
Acid resistant paints	Cyclized rubber + Aroclor 1248	Air dry
Ship bottom paints	Cyclized rubber + Rosin + linseed oil + Arochlor 1248	Air dry
Swimming pool paints	Cyclized rubber + Aroclor 1248 or cyclized rubber + Alkydol S-1043 + Archlor 1248	Air dry
Mirror backing paints	Cyclized rubber + S-1107	Air dry
Road marking paints	Cyclized rubber + S-1107	Air dry
Underwater paints	Cyclized rubber + Chlorinated Diphenyl or drying Petroleum oils	Air dry
Zinc dust paints	Cyclized rubber + Aroclor 1248	Air dry

Table X. Types of paints that may be formulated with cyclized rubber.

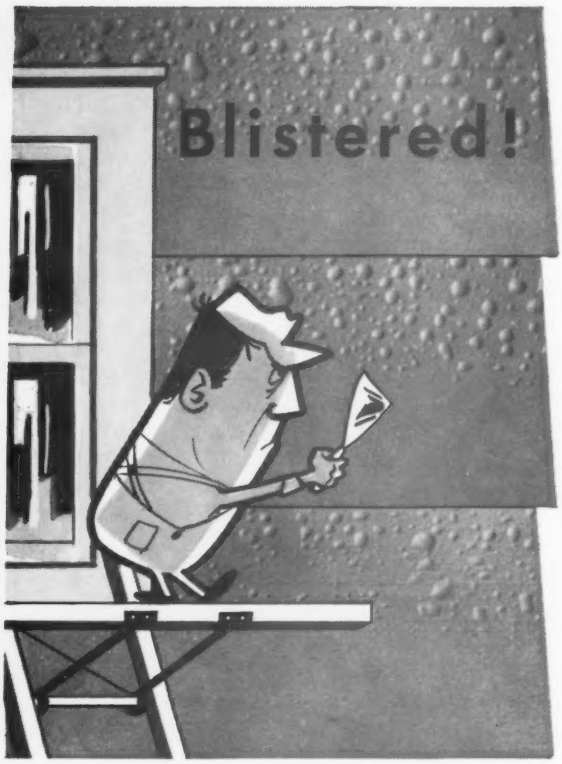
The various possibilities for combining these raw materials with cyclized rubber is demonstrated in Figure 10. A triangular diagram showing a three-component system of cyclized rubber-Aroclor and Alkydol S-1043. The composition of a binder is the coordination crosspoint. The black line coming from the crosspoint indicates the cyclized rubber content on the solid side of the triangle, and uneven-broken line on the uneven broken side of the triangle the plasticizer content, and the even broken line on the even broken side of the triangle the alkyd resin content.

A mixture will be considered having on one side a variation Alpex-Aroclor ratios of 55: 45 to 80: 20 and on the other side an alkyd resin portion within the triangle combination of 0-80%. This space bordered by lines ab and cd comprises about the following combinations, which based upon their general properties as for instance, dry, hardness, elasticity, etc. are of special interest for practical purposes.

The best chemical resistance naturally lies within the absence of alkyd resins remaining within a two material composition made out of Alpex and Aroclor in the ratios of 55: 45 to 80 : 20. This is represented by the section cd of the baseline. With increasing amounts of alkyd resin, the resistance diminishes, and it must be mentioned that with the alkyd resin content remaining constant, and with increased quantities of plasticizer in place of Alpex, three results a diminished chemical resistance. This clearly demonstrated by the direction of the curves separating the various fields of chemical resistance.

The section A with an alkyd of 5-15% depending on the plasticizer content can be classified as highly chemical resistant. The compositions lying in this section are suitable for many applications cited in group A of the classifications mentioned above. In comparison with pure Alpex-Aroclor combinations, the utilization of alkyd resins may result in advantages as far as improved recoatability, thermoplasticity and abrasion resistance are concerned.

(*Turn to page 84*)



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THE COATING CORNER

By
Phil Heiberger

The author continues his random reflections on various aspects of the paint industry. The opinions expressed in this column are his alone and do not necessarily reflect those of this publication.

Pitchmen, Pressagents, Publicists

CONTRAST heightens drama, and Scott M. Cutlip and Allen H. Center, authors of *Effective Public Relations* (Prentice-Hall, Inc., 1952) apparently aware of this, succeed in introducing their subject with appropriate dramatic flair by juxtaposing several debatable definitions of public relations in their book's very first chapter.

P. Heiberger

Next to Harold Ickes description of public relations practitioners as "pitch men, complete with Harvard accent and trick polls," we find Walter Lippman's observation that some people think of a publicity man as a press agent with a tie and believe that when he puts on a coat, he becomes a "public relations counselor." Westbrook Pegler's wry comment that "public relations is only an aristocratic term for publicity or press agentry" is recorded here too.

Just the Facts, Ma'am

Next Cutlip and Center quote John P. Syme, of the Johns-Manville Corporation, who said, "(Public Relations) is the business of conveying the facts to supply every potential friend with all the evidence he needs to form a definite idea of the value and importance to him of your company."

The authors themselves make this statement about public relations: "In the center of its mushrooming growth there is a solid layer of sound, ethical practice. At its core is the concept of public relations as a systematic means of repairing and restoring the broken lines of communication in America's industrialized, urbanized society."

Everybody in the Act

Of course, it's true that some public relations programs smack strongly of P. T. Barnum, but today many of us recognize that in the final analysis each member of every group is and can not help being a public relations practitioner, inasmuch as each member represents his group in the eyes of the world. Each of us, then, has it well within his power to "convey the facts" about his group to other groups and to repair and restore broken lines of communication.

Because this is generally recognized, many industrial groups, including the paint industry, consciously practice good public relations by encouraging members to seek and take advantage of opportunities to speak to other groups: consumers, prospective enployees, students in need of career guidance, etc. For such occasions it would be helpful and handy to have at one's disposal bonafide general statistical material and speakers' aids. This is not an original idea. Several professional societies have prepared speaker kits to aid speakers.

Tips for Talks . .

One such group is the Technical Association of the Pulp and Paper Industry (TAPPI). An article entitled "Background Information for Paper Industry Talks" by Philip E. Nethercut, which appeared in TAPPI 41, 38A (1958) is an example of what I am referring to.

A few quotations from the first few paragraphs will clarify the purpose. "Members of TAPPI are frequently asked to tell other people about the paper industry. Sometimes this involves explaining the technology of pulping and papermaking, for example, to a high school science club or a university engineering class. At other times a less technical description of paper and the paper industry may be requested by a church, civic, or social group or other local organization. For all of these audiences we in the paper industry have a fascinating story to tell. Telling that story effectively benefits not only the audience, it enhances the prestige of the speaker and the paper industry as well.

"A good speech, though, requires careful preparation. It must be

tailored to the interests of the audience. The purpose of this article is to aid TAPPI members in such preparation by presenting statistics, suggestions, and quotations which may be useful in their presentations."

Seven Packed Pages

Then in seven well packed pages the author presents facts, statistics, demonstrations, suggestions and lists of motion picture films pertaining to the industry.

Imagine how valuable such an article would be to us if paint were the subject instead of paper and how well it would serve our publicity and recruiting problems. With such an article at hand any well informed intelligent member of our industry could quickly and easily prepare an excellent speech on short notice.

If a comparable compilation for the paint industry does exist, I would be grateful to be informed of it. If not, I respectfully suggest that it be considered as a worthy project for either a Federation or an Association committee.

Something's Gotta Give

A LEFTHANDED compliment has been paid to the paint industry. It appeared in the January 24, 1958 issue of *Chemical Week*. Paint products have improved to the point of no return, practically, because they are so good (from the point of view of adhesion) that they are creating serious problems for paint stripper manufacturers! This is beginning to look like another case of the irresistible force and the immovable object.

Red Carbon

A STANDARD joke among paint chemists is the possibility of making a white carbon pigment for good hiding power at low pigment volume and low cost comparable with carbon black. Among the uninitiated this is still considered a provocative idea!

A white carbon, we regret to say, may always be a dream, unrealizable, but a reference has been made to a "red carbon." (L. Schmidt, H. P. Boehm, et al. Z. Anorg. u. Allgem. Chem. **296**, 246-261 (1958).

Now don't go jumping on your purchasing agent for failing to get samples, since red carbon is not likely to find a place in your formularies. This carbon is prepared as a polymerization product of carbon suboxide; and when prepared in the absence of water, it has a stoichiometric composition of C_3O_2. It is extremely hygroscopic and on addition of water, carbon dioxide is formed, in addition to other compounds.

From the nature of the functional groups (−OH, −COOH, =CO) found after water addition and the physical and spectroscopic data, the indications are that "red carbon" consists of hexagonal layers of about 10 A° diameter with the functional groups bound to the edges. The oxygen atoms are introduced in part, inside the hexagonal network, replacing the carbon atoms.

Infrared

BY this time, the use of infrared spectroscopy is "old hat" to most paint chemists. Aside from the more routine analyses, the technique is invaluable in the study of chemical changes under aging conditions. R. T. Conley (Canisius College, Buffalo, N. Y.) has developed a new method for determining thermal stability of resins, which he describes in a paper entitled "Environmental Effects in the Infrared Spectra of Polymeric Materials" (*Chemistry and Industry*, page 1630, December 6, 1958).

In studying the thermal degradation of a film forming resin, the standard procedure is to "apply a thin film of the resin on a rock salt plate and heat the coated salt plate in an oven. The plate is then intermittently removed, cooled, and the spectrum of the film recorded. This technique has been used in the study of the thermal degradation of polystyrene, polyvinyl formal, cellophane, and in the comparison of the thermal stability of isomeric phthalic alkyds and silicones. However, as far as can be determined, it has not been previously possible to compare various samples of the same substance at different aging times in a quantitative fashion in order to evaluate the thermal stability of the resin."

Conley employed carefully coated metal plates for aging the samples (modified polyester polyamide resin), electrolytic lifting of the aged coating from the surface, followed by the determination of the spectrum of the resulting film.

"For the first time it has been possible to gain information as to the effect of aging on different surfaces as well as to show that infrared can also be applied, at least in in some cases, to the evaluation of structural as well as chemical changes in the polymeric material. Comparative studies of different polymeric systems are therefore more reliable since any effect due to the substrate,such as a catalytic effect upon the degradation or structural arrangement can be studied simultaneously. From data of this type, corroborative inferences can be drawn regarding the reliability of other testing methods for specific physical property evaluation such as dielectric strength, craze life, flexibility, heat shock. . . ."

Merger

WE may soon see the paint and pharmaceutical and cosmetic industries merge! Recognition that salves, creams, and cosmetics are truly surface coatings or protective films may be heightened by the following article, "Synthesis of Epoxide Polymers of Steroidal Compounds." (W. F. Head, Jr. and W. M. Lauter, J. Am. Pharm. Assoc., Sci. Ed. **47**, 563 (1958).

A series of twenty ethylene oxide and propylene oxide addition polymers of ursolic acid and some of its derivatives were made and characterized. Properties such as effect on surface tension, formation of O/W emulsions, clarity of emulsion, etc. were studied.

In addition to ursolic acid, polymers of cholic acid, vitamin A, vitamin D_2, vitamin E, cortisone, estradiol, and testosterone were prepared and studied. Also, attempts to prepare steroidal polymers with highly branched or crosslinked side chains by using glycidol and epichlorhydrin were unsuccessful.

Although the purpose of this work is primarily to solubilize these drugs, making them easier for the body to utilize, it is interesting to observe that many of the techniques and reactions of paint chemistry are being employed.

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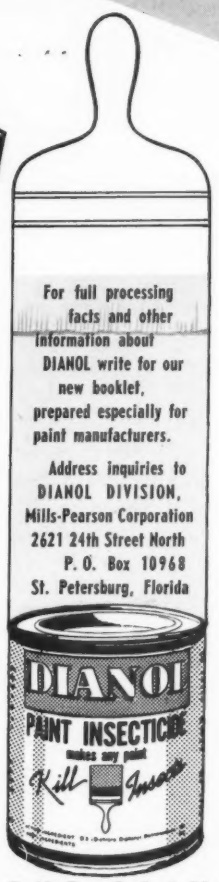

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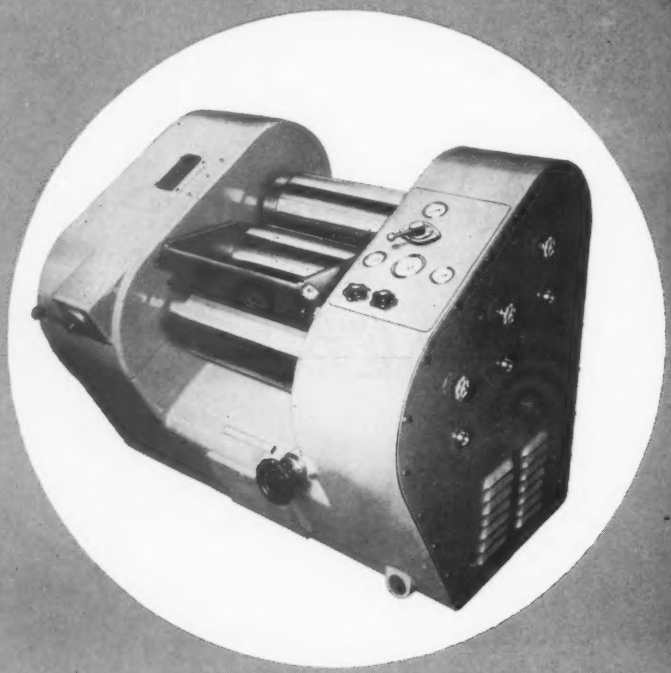

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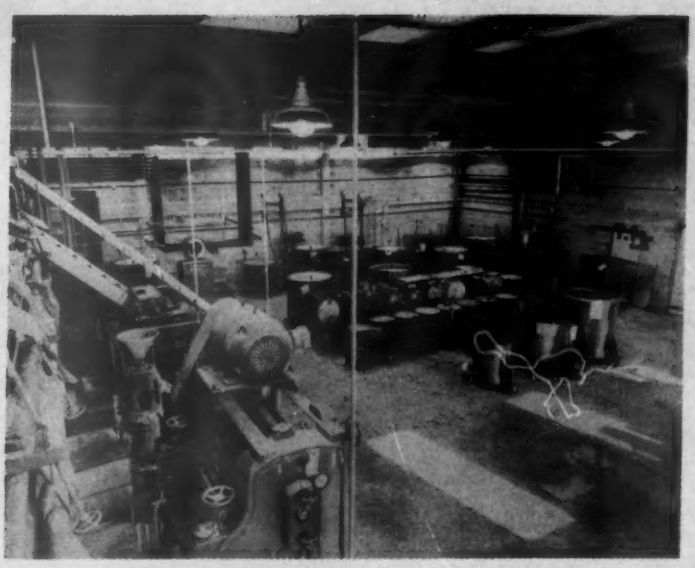

View of the thinning and shading section of the new Sherwin-Williams plant on Annacis Island, near Vancouver. For a look into this new and modern paint factory, see page 60.

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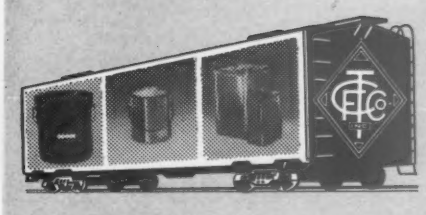

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Effective

INVENTORY MANAGEMENT

By
Lawrence Shatkin

WHEN scheduling production consideration must be given to the proper balance between the economics of production and the cost for carrying all inventories. The aim of a production manager is to manufacture a unit with the least possible cost to the company. The above thesis must also embrace a balance between cost and customer service. If the purpose of a company is to create a customer, then it is axiomatic that any inventory study or adjustment take into account the "service" requirements.

Inventory control is affected from many forces acting together or in contradistinction to one another. It means that pressures are applied from different directions and each one must be considered in its own right.

Pressure Areas

Effective inventory levels can be used to stabilize production and help maintain steady employment. This assists management in its social goals of "having a good place to work." It helps to reduce the costs of labor turnover in terms of worker morale, lowers training costs, attracts superior workers and brings about lower personnel administration costs.

A factor affecting inventory levels is the pressure for better customer service. This prevails whether business is good or bad. It means that a level of materials has to be maintained that will enable a firm to produce and deliver on a competitive basis.

The desire for lowering fixed costs can come about when these costs are spread over a larger unit load. This often results in an increased inventory.

Adjustments in inventory always bring about different financial pressures which have to be carefully considered by top management.

Purchasing activities will have its influence on effective inventory management. The eternal struggle between service and costs means that a minimum level is necessary that will ensure and fulfill the requirements of the company.

The preceding discussion indicates a need for controlling inventory. We can either prevent it, regulate it, or eliminate it.

Prevention of Inventory

The sales department, through its marketing research activities, confines new product testing to specific areas. Any modification will affect a much smaller quantity than if it were introduced on a national basis. The desire for increased sales can cause an inventory build-up, which may not place the company in the best position. It may be necessary to retrench in order to allow the company to reach a more workable plateau.

Manufacturing procedures can be directed toward preventing inventories. The faster the manufacturing cycle, the smaller the quantity of finished goods required for service.

The purchasing department can, by the use of competitive buying, open many doors of better service which may allow reduction of company inventory. It can exert influence to have the vendor enlarge his stock which, in turn, becomes a safety factor for his own company. Obtaining several sources of supply for an item is another way in which inventory can be prevented.

Regulation of Inventory

Regulation of inventory may be affected through a good production control system. In discharging the production ordering function, there is involved the problem of adjusting inventory to:

1. Actual sales requirements;
2. Factory productivity level;
3. Quality variations.

Elimination of Inventory

"Dead wood" or obsolete stock requires elimination. There are two main approaches to this elimi-

WORK OFF MATERIAL

Quantity on hand _____ Paint _____
Location _____
Date _____ Instructions _____
_____
_____
_____ Signed

Date _____ All used up ☐
IF NOT ALL USED UP, NOTE HOW MUCH USED >>>Used _____ gals.

Date _____ All used up ☐
IF NOT ALL USED UP, NOTE HOW MUCH USED >>>Used _____ gals.

Date _____ All used up ☐
IF NOT ALL USED UP, NOTE HOW MUCH USED >>>Used _____ gals.

RETURN THIS NOTE TO THE SIGNER ABOVE

Figure 1.

The opinions expressed in this feature are not necessarily those of any particular firm or organization.

nation: routine clearance and special clearance.

Unless a concerted effort is instituted to decrease this work off material, valuable space and money are being thrown away. A form found useful for this particular purpose is shown in Figure 1.

Determining Standard Turnover

Optimum turnover of raw material is determined through analysis of each group or kind of material and parts purchased or manufactured, using the "maximum-minimum ordering-point" technique, which is one of the best ways of determining optimum inventory and which is applicable to both large and small companies. This procedure enables one to establish a re-order point and a standard order quantity. It allows one to establish the minimum point that will serve as a safety margin. The re-order point should cover the minimum inventory and the projected quantity of stock required between placing the purchase order and delivery.

The A-B-C- Method

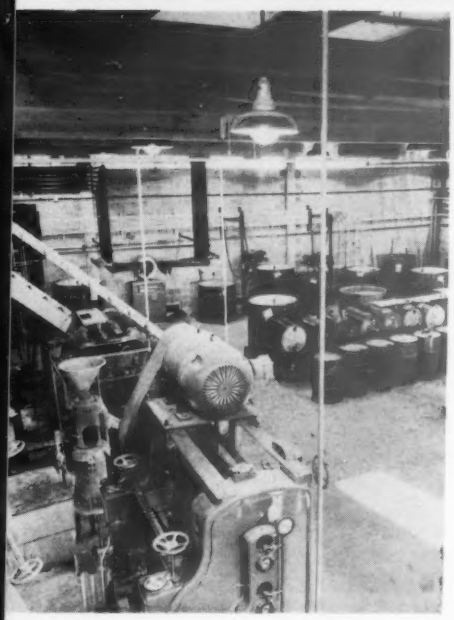
This is a relatively new technique for systematizing raw materials and sundry items in order to achieve effective inventory management. It is "control by exception."

Items are classified into A, B or C categories according to their inventory investment value. The top ten per cent are class A items having priority across the board with respect to ordering, scheduling, re-ordering, etc. It is important that their turnover be as rapid as possible.

Items in class B are of secondary importance and from a value standpoint, do not require as close surveillance as the former group.

Class C items are relatively inexpensive, necessary materials. Although their inventory value is small, they may represent a large percentage of the total number of items. These articles should be stocked economically to minimize purchase order requisitions, bookkeeping entires, telephone calls, time spent for receiving, etc. It yields decreased paperwork and handling.

By controlling your inventory effectively, fewer production delays will arise, ensuring lower costs.

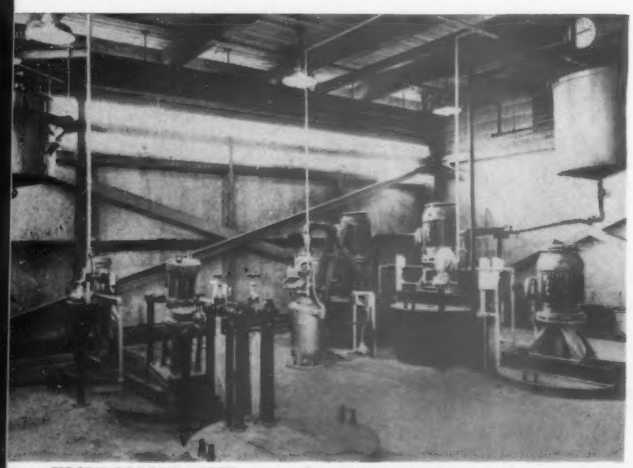


THIS VIEW of the thinning and shading section of the paint manufacturing floor was taken from the mezzanine. Pipelines (in left background) run from the overhead storage tanks and terminate at the floor scale. Thinning is done by weight at this point. Laboratory adjoins this area.

SHERWIN-WILLIAMS C

FACILITY GOES ON S

New production unit, located at Anna
Vancouver, B.C., contains 50,000 square feet o
a rated capacity of one-million gallons of paint



EMULSION PAINT manufacturing equipment is set up on the mezzanine. All mixing, milling, thinning and shading operations are done at this level; packaging is done in the area below the mezzanine.

AT THIS FILLING POINT, the platform in background is an electrically operated elevator that can handle three portable tanks simultaneously. The air-operated filling machine also caps and codes the containers.

CANADA STREAM

Annacis Island, southeast of
feet of floor space and has
paint products annually.

A SHERWIN - WILLIAMS paint and varnish plant at Annacis Island, near Vancouver, was opened recently.

The new production unit, which has a rated capacity of one million gallons of paint products annually, replaces smaller facilities in Vancouver. It is situated on a four-and-one-half acre tract in the Annacis Industrial Estate. This carefully planned and rapidly growing industrial area, an island in the Fraser River, is being developed by Grosvenor-Laing (B.C.) interests.

Typical of the plant's planned-ahead facilities is the development laboratory. Research emphasis is on the development of finishing materials related to the growing needs of Canadian industry. As service requirements increase, the laboratory will be expanded.

An integrated unit equipped to manufacture all of the vehicles and intermediates used in producing a complete line of Sherwin-Williams paints, the plant contains 50,000 square feet of floor space. Offices, warehouses, laboratories and paint production facilities are combined in a single building. The varnish plant, with its testing and filling facilities, is located in a separate structure.

Basically of one-story construction, the main building has a two-story wing along the front and one side. The ground floor of this area houses washrooms, lunchroom and boiler room; the second level is given over to offices.

Palletize Raw Materials

Raw materials are stored in a dock level warehouse with more than 18 feet of clear piling height. This arrangement permits speedy, palletized storage of drystocks, whether received by rail or truck. Facilities for handling the latter shipments include self-levelling dock boards. More than 115,000 cubic feet of covered storage space is available in the raw material warehouse.

Adjoining this storage area is the one-story-and-mezzanine paint plant. Mixing is done on the mezzanine, with dry raw materials and drums being placed directly on the elevated area by fork-lift trucks. Bulk liquid raw materials are piped into this area from the tank farm or from storage tanks located in a pent house on the roof.

From the mixers, the paste flows to mills located on the lower level, where it is ground into portable tanks. The tanks are moved to a large floor scale for addition of the balance of liquids received through pipelines running from storage tanks. Laboratories immediately adjacent to the thinning and shading area speed testing operations prior to filling and capping.

After testing, the tanks holding the approved batches are elevated on a platform lift. From here the paint is filled, capped and coded into pre-labelled cans by machines set up on the ground level. From the filling and capping operations, cans are placed directly into prestencilled cartons on pallets and moved into the finished goods warehouse.

This warehouse, at the front of the paint plant, has 360,000 cubic feet of usable storage space. Finished goods are stored in pallet racks, being carried there by lift trucks which can be extended to the full 18-foot piling height. The shipping dock at the front can handle six large trucks and is equipped with self-levelling dock boards.

Shipments from the plant will be made throughout BritishColumbia and to parts of Alberta.

Handle Liquids in Bulk

Bulk liquids enter the separate varnish plant from a nearby tank farm which is so situated that materials can be received from both tank cars and tank trucks. Remote controlled pumps bring the liquid materials directly to the varnish kettles. Portable kettles are currently being used, but provision has been made for the early addition of large fixed kettles. Fumes from cooking operations are drawn off and catalytically burned to eliminate atmospheric contamination.

After thinning, testing and filtering, finished varnishes are pumped to the tank-filled storage room in the pent house above the paint manufacturing area. Pipes to this storage area are carried on an overhead pipe bridge and material flow is through a system of remotely controlled pumps.

Arrangement of the buildings and tank farm permits straightline production of the many types of paint and varnishes being made in the plant. Materials flow naturally from the raw materials warehouse, through manufacturing, into the finished goods warehouse and onto the shipping dock with a minimum of criss-crossing and no backtracking. This pattern of straight flow will be continued as the plant is expanded.

C. M. Skinner is general manager of factory operations for the Sherwin-Williams Co. of Canada, Ltd. Superintendent of the new facility is W. O. Spencer. He is assisted by S. C. Turner, formerly at the Montreal plant of the company, and Walter Beattie, office manager.

Opening of the new Canadian plant marks the second major expansion of paint production facilities by Sherwin-Williams within the past year. Last fall a seven million gallon paint, varnish and lacquer plant at Garland, Texas was put into operation by the Sherwin-Williams organization.

In addition to the new Annacis Island installation, the Sherwin-Williams Co. of Canada, Ltd., has production units at Montreal, Toronto, Red Mill and Winnipeg.

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Maximum Flexibility
in LIMITED SPACE

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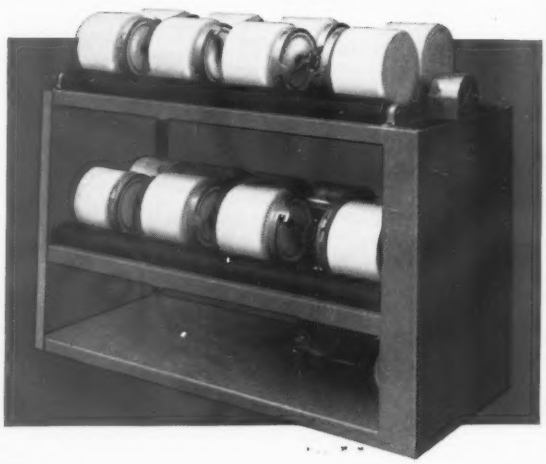
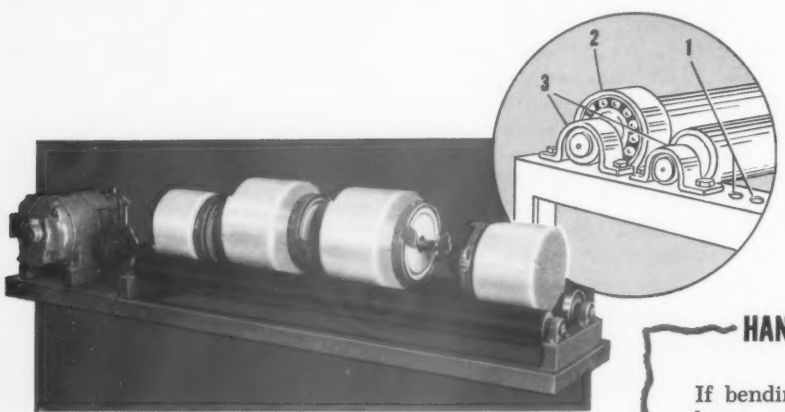


"U. S." Long-Roll Jar Mills are specially engineered to make most efficient use of valuable floor space. Their greater capacity and flexibility make it possible to expand substantially your milling facilities within virtually the same floor area as occupied by other models.

These units have sturdy welded steel frames built for long, dependable service under rigorous operating conditions. The 3″ diameter parallel-ground rollers are made of long-wearing chemical- and solvent-resistant Neoprene rubber. Heavy-duty motors and drives assure ample power.



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PROCESS EQUIPMENT DIVISION

105-T

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New Developments

Polyester Coatings For Masonry Surfaces

Prior to the introduction of synthetic resins to the paint industry, the problem of painting masonry surfaces was an acute one since oleoresinous paints were not suitable for this particular application. Such paints, when applied over masonry surfaces, flaked rather badly because of their inherent poor alkali resistance.

Within the last 15 years, however, several new synthetic resins have been used in the formulation of paints designed specifically for masonry application. Among these are chlorinated rubber, butadiene-styrene, acrylates, styrene, polyvinyl acetate, polyvinyl chloride, and vinylidene chloride.

More recently, water-emulsion paints based on styrene butadiene, polyvinyl acetate, and acrylic latices have found widespread use in all types of masonry finishes. Both epoxy coating and the amine modified-epoxy emulsions have also enjoyed considerable success in the masonry field.

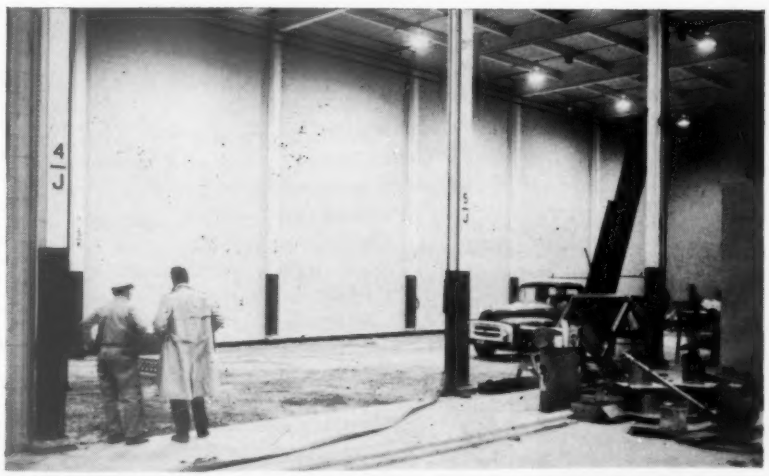
A new line, based on polyester resin, has been added to the masonry-coating materials. These coatings (two-package system) are said to exhibit outstanding hardness, good chemical resistance (including acid and alkali resistance), good solvent resistance, excellent weatherability, and washability characteristics.

Such coatings may be formulated with "Isolite*" (a series of polyester resins manufactured by Schenectady Resins, Division of Schenectady Varnish Co., Inc.). A suggested formulation is presented in Table I.

*A registered trade-mark of Schenectady Varnish Co., Inc.

Ingredients		Parts by Weight
Isolite	712	45
"	714	45
"	780	10
Inert Pigment		54
Colored Pigment Pastes		0.5 to 2.0
6% Cobalt Naphthenate Drier		0.2 - 1.0
Cab-o-Sil (Silica GEL)		3 - 6

Table I.



Suggested applications of polyester coatings.

Pigmentation

Inert pigment (such as calcium sulfate, calcium carbonate, blanc fixe, talc, asbestine, etc.) may be employed. However, the amount incorporated will depend on the oil absorption number of the particular filler.

Colored pigments for this purpose are readily available in paste form from leading suppliers, or the paste can be made by dispersing the pigment in "Isolite 904," a polymeric plasticizer.

The purpose of the "Cab-o-Sil" in the suggested formulation is to make the paint thixotropic—enabling the application of thick coats by brushing, roller coating, spraying, or troweling.

Mixing

The polyester resins and the inert pigment are agitated together in a high-speed mixer until a smooth paste is formed. Then the colored pigment paste is added until tinting strength is obtained, cobalt drier is then incorporated next and after five minutes the "Cab-o-Sil" is added.

Curing

The preceding formulation contains all ingredients except the catalyst which is added just prior to use. The catalyst employed is Lupersol DDM (Lucidol Div., Wallace & Tiernan Co.) or MEK Peroxide (distributed by McKesson & Robbins). The amount of catalyst to be employed is based on 1 to 2% of the polyester in the formula.

The coating will harden at room temperature (77°F) in one to five hours, depending upon the amount of cobalt drier present.

Pot-Life

The pot-life averages about 3-4 hours with the least amount of cobalt drier. It is recommended that no more than five gallons and preferably less than one gallon be mixed at a time and be used in less than one-half hour. In spraying operations, if a two-headed catalyst gun is used, pot-life is not a problem.

Packaging

Ordinary cans and drums may be used to package the polyester coating. However, the catalyst should be supplied in glass containers because of its rapid corrosive action on metal.

Uses

This coating is supplied in 100% solids and requires no thinning for application on all types of masonry surfaces, and cement as well as asbestos wallboard. It is claimed that a tile-like finish can be obtained with this two-package polyester coating and that it will also enhance the durability of brick, cement block, concrete, etc. Recommended applications include swimming pools, shower rooms, locker rooms, service stations, operating rooms, refrigerator rooms, laundry rooms, and basements. Highly decorative coatings, including the popular multi-colored type, can be formulated with this polyester resin. Other uses include the coating of metal surfaces as well as finishes on wood and furniture in general.

Surface Preparation

All surfaces must be completely dry both internally and externally before applying the polyester coating. All foreign matter and efflorescence must be removed. Smooth concrete must be etched, using two parts water and one part muriatic acid. This acid solution should be allowed to react for twenty minutes before flushing with clean water. Very coarse masonry block can be filled with a cement scratch coat, allowed to dry and brushed free of all loose particles.

New Carbide Vinyl Latex Coating Formulas

Over six years of experimentation and exposure testing with "Bakelite" vinyl acetate resin latex WC-130 paints has led to improved formulations for increased durability, according to Union Carbide Plastics Company, Division of Union Carbide Corporation.

Results of numerous applications, throughout the country, of WC-130 latex coatings on masonry panels were used in preparing the new formulas. Such formulations offer excellent ultra-violet light stability, alkali and water resistance, good pigment-binding characteristics and package stability.

There are three filming aids in the formula. Plasticizer is chosen for its flexibility and softening effect on the resin. Volatile filming aids which solvate the resin during film formulation are used so the film will reach a hard, abrasion resistant state rapidly. Volatile filming agents used in the formulas are butyl "Carbitol" acetate and 2-ethylhexyl acetate. Butyl "Carbitol" acetate is a particularly effective agent, yet does not hinder latex stability or other desired properties. Used in small amounts, 2-ethylhexyl acetate controls foaming on application to extremely rough and porous surfaces. In addition, the agent exhibits a pronounced tendency to reduce bridging over pores and crevices.

For various localities, changes in composition may be necessary to meet different climatic conditions. The formulations given here, for example, contain a minimum of mildewcide. In areas where mildew is a problem, the agent may be increased up to 100 per cent with no adverse effect on the performance. For unusually cold climates, greater low-temperature flexibility may be obtained by replacing one third of the prescribed tricresyl phosphate with "Flexol" plasticizer 4Go.

See Table I for a typical formulation.

FORMULA:	Lb.	Gal.	Wt. %
Titanium dioxide (1)	192.55	5.50	17.45
Titanium dioxide (2)	21.40	0.66	1.94
Mica, 325 mesh, water ground	26.99	1.14	2.45
ASP-600	55.58	2.57	5.04
"Lorite"	20.09	0.95	1.82
"Bakelite" vinyl acetate resin latex WC-130 (58.5% N.V.)	326.74	35.14	29.61
Tricresyl phosphate	28.67	2.92	2.60
Butyl "Carbitol" acetate	15.30	1.87	1.39
2-Ethylhexyl acetate	3.82	0.53	0.35
Ethylene glycol	18.97	2.04	1.72
"Tamol" 731 dispersant (dry basis)	2.16	0.22	0.20
"Tergitol" NPX surfactant	1.08	0.12	0.10
Tetrasodium pyrophosphate	0.31	—	0.03
"Cellosize" Hydroxyethyl Cellulose WP-300, 7.5% soln.	99.63	11.70	9.03
"Butrol" mildewcide	4.05	0.38	0.37
Water	285.78	34.26	25.90
Theoretical Yield	1103.12	100.00	100.00

(1) Titanium dioxide; rutile; chalk-resistant, as described in Federal Specification TT-T-425a, Type III.

(2) Titanium dioxide Anatase, chalking; as described in Federal Specification TT-T-425a, Type I.

Table I. Formula suggestion PF-2075: White exterior paint.

Another packaging advance by Continental

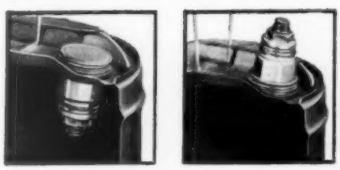
the new HI-STACKER

utility can with reversible spout

- *Saves time, space, filling and shipping costs*
- *Simple to palletize*
- *I.C.C. approved*

Continental's new, Dome-top Hi-Stacker makes every inch of shipping, storage and display space count. It's easy to fill, easy to handle. Filler openings are available to fit your requirements. For further details, ask your Continental man.

REVERSIBLE SPOUT RIDES SAFELY, ATTACHES EASILY



Spout remains inverted during shipment and storage. To pour, spout is reversed — ready for fast, smooth dispensing. Spout remains in fixed position until container is empty.

Looks like Continental's famous Dome-top utility can (at left). Has all its sales features. Completely redesigned to save space and money.

CONTINENTAL CAN COMPANY

Eastern Div.: 100 E. 42nd St., New York 17
Central Div.: 135 So. La Salle St., Chicago 3
Pacific Dic.: Russ Building, San Francisco 4
Canadian Div.: 5595 Pare St., Montreal, Que.

ASBESTINE 325

64 YEARS of production have paid off for International Talc Co. and its customers As the world's largest producer of magnesium silicate, International Talc Co. announces the availability of their newest member to the family. . . . Asbestine - 325

★ THIS NEW PRODUCT FEATURES

Good dispersion with minimum use of oil needed in grinding. . . . enables formulating at higher pigment volume concentrations. Thereby. . . .

REDUCING RAW MATERIAL COSTS

without affecting performance of storage characteristics.

Also available in other grades. . . .featuring these advantages

- **1. Available in low, medium and high oil absorption**
  2. Pure white — suitable for white or colored paints
  3. Acicular structure affords good suspension
- **4. Mixes readily in all paint vehicles**
  5. Contributes to greater durability in exterior paints
  6. Excellent flatting agent for flat or semigloss coatings
- **7. Uniformly low moisture content (less than .5% loss at 212°F.)**
  8. Bulking value 4.2 gallons per 100 lbs.
  9. Packed in 50 lb. paper sacks for your convenience

PRODUCT OF

INTERNATIONAL TALC COMPANY, INC.

ESTABLISHED 1893

WORLD'S LARGEST PRODUCERS OF TALC

90 WEST ST., NEW YORK, N. Y.

INTERNATIONAL TALC CO., INC.
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Please send FREE Sample and Technical Data on ASBESTINE 325.

Name.....
Company.....
Street.....
City.....State.....

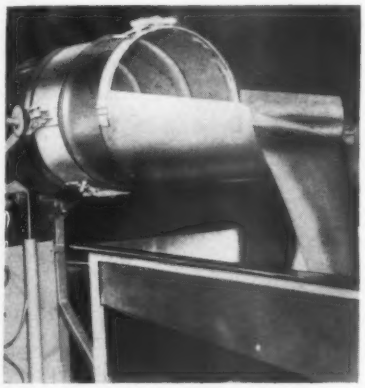
SEND COUPON FOR FREE SAMPLE AND TECHNICAL DATA ABOUT

ASBESTINE 325

S. W. Tuttle, Vice-President

NEW EQUIPMENT AND MATERIALS

This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.



STERLING FLEISCHMAN

POURING SPOUT
Dry or Viscous Materials

An adjunct to the firm's "one man drum lift" has been made available—a pouring spout for use in dumping dry or viscous materials.

Attached to the drum in seconds, it affords pouring control without spillage. Can be furnished for drums of any size.

Available in carbon or stainless steel.

Sterling Fleischman Co., Dept. PVP, P. O. Box 94, Broomall 1, Pa.

TUNG OIL
Fortifying Plasticizers

The commercial availability of "Polytung Oil" has been announced. It is a pure tung oil processed by a high temperature thermolizing operation which produces unusually good results in clear oil protective coatings or cold cut varnishes.

Said to be miscible with many normal oil insoluble resins, and lends itself particularly well to fortifying plasticizers for vinyls, chlorinated rubber and cellulose coatings.

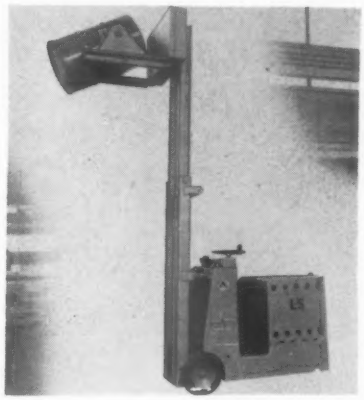
Degen Oil & Chemical Co., Dept. PVP, Box C, Greenville Station, Jersey City 5, N. J.

FORK TRUCK ATTACHMENT
Operator Controlled

A fork truck attachment that stacks, transports and dumps barrels and drums now offered.

This attachment said to add tremendous versatility to any fork truck. It not only handles wooden barrels and steel or fibre drums through clamping pressure but also dumps their contents by hydraulic tilting action. The objects handled can vary from 18" to 26" in diameter and be tilted up to 180° forward for dumping.

All of the operations—clamping, rotating, lifting, lowering and tilting—are controlled by the operator from his driving position.



LEWIS-SHEPARD

The attachment can be placed on any of the L-S spacemaster electric fork trucks or jackstacker "Walkie" units. Capacity is 1000 lbs.

Lewis-Shepard Products, Inc., 125 Walnut St., Dept. R9-3- PVP, Watertown 72, Mass.

REFLUX CONDENSER
Can Be Stacked

A reflux condenser, said to be completely new, now available.

The new 7-748 condenser consists of a bulb 2½" in diameter by 4½" long with outer standard-taper 24/40 joint at the top and inner 24/40 joint at the bottom. Overall height: 9½".

Since only standard-taper joints are used, the condenser is easily inserted into a system.

Several 7-748 units, it is claimed, can be stacked one atop the other.

A double-wall thimble-shaped condenser is sealed inside the outer bulb with two sidearms (for water connections) extending through the bulb. The open end of the condenser faces downward so that vapors passing into the bulb are condensed, for the most part, on the condenser's inside wall.

Fisher Scientific Co., Dept. PVP, 384 Fisher Building, Pittsburgh 19, Pa.

PAIL RACK
Balances 5-Gallon Pails

A new "pour-easy" pail rack has been introduced.

The "pour-easy" pail rack said to perfectly balance 5-gallon pails and effectively eliminates lifting and waste by spilling. The pail rack fits all size 5 gallon pails, with or without bails, is heavily constructed and will not tip or sway. With the rack, any material can be poured from 5-gallon pails into small containers or bottles without spilling.

MULTI-METER

UPGRADE your paint line

with an isophthalic resin

Let us provide you isophthalic resin formulations and samples that will give your products improved performance properties at the same or lower cost. Whether you market resins, house paints, interior flats, gloss enamels, baking finishes or industrial finishes we have resin formulations and samples for your evaluation.

Oronite, the original and only experienced producer of isophthalic, can also show you how to employ your present equipment in processing superior isophthalic based finishes.

If you are interested in marketing improved alkyd paints or resins—Oronite's extensive development experience is available to you. Just contact your nearest Oronite office.

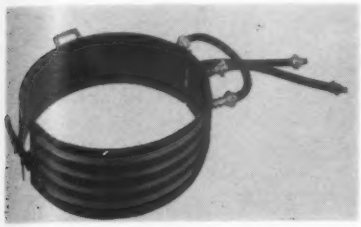
ORONITE CHEMICAL COMPANY
A CALIFORNIA CHEMICAL COMPANY SUBSIDIARY

EXECUTIVE OFFICES • 200 Bush Street, San Francisco 20, California
SALES OFFICES • New York, Boston, Wilmington, Chicago, Cincinnati, Cleveland, Houston, Tulsa, Los Angeles, San Francisco, Seattle
Foreign Affiliate: California Chemical International, Inc., San Francisco, Geneva, Panama

5503

The frame is constructed of 7/8"—20 gauge black enameled steel tubing and the band is 1"—19 gauge zinc plated steel.

Multi-Meter Corp., Dept. PVP, P. O. Box 6594, 1041 Custer Drive, Toledo 12, Ohio.



TRANTER

DRUM-WARMER
For 55-Gallon Drums

A device for applying heating or cooling to conventional 55-gallon steel drums now being marketed.

The new drum warmer consists of a single-embossed Tranter "Platecoil" with quick-acting clamp and flexible connections to permit rapid change from one drum to another or changing the location on an individual drum. Insulated handles are included for safe, easy handling of the drum warmer.

The flexible connections can be connected to steam lines, hot or cold water or some other refrigeration source to add or withdraw heat from the contents of the barrel.

The new device is expected to simplify storage problems of certain types of material and enable users to bring contents of the barrels to the required temperature more quickly to ease processing schedule problems.

Platecoil Division, Tranter Manufacturing, Inc., Dept. PVP, 735 E. Hazel St., Lansing 9, Mich.

BALANCE
Records Weight & Temperature

New automatic, recording analytical balance available. This new electronic instrument simultaneously records both weight and temperature against time.

The model has two pens, using different colors, and records both weight and temperature against time on the same chart.

For thermogravimetric analysis the sample can be suspended from the balance and weighed in a furnace. For differential thermal weighings, samples can be suspended from both pans of the balance. The balance is claimed to be accurate to plus or minus 1/10 mg., has a capacity of 200 grams, and temperature ranges of minus 25°C. to plus 525°C. or minus 50°C. to plus 1050°C. Both weight and temperature readings are linear.

Wm. Ainsworth & Sons, Inc., Dept. PVP, 2151 Lawrence St., Denver, Colo.

ELECTRIC FURNACE
Multi-Purpose

Type 2100 Thermolyne top-loading electric furnace, a multi-purpose unit, said to be adaptable for use as salt bath, melting, vertical muffle, or crucible furnace.

Its many recommended laboratory and shop uses encompass investigative and pilot runs as well as short run production and the heat treating of small parts. The maximum chamber temperature for intermittent operation is 1900° F.

The basic unit includes the hexagonal furnace (115 or 230 volts, chamber 5 5/8" Dia. x 11½" Deep), stainless steel pot (6½" Dia. x 7½" Deep) with cover and convenient lifting handle, and thermocouple in protection tube. Optional maximum-use ac-

cessories include a refractory ladle, refractory chamber liner, and insulated cover.

The furnace case is of heavy-gauge welded and braced steel construction and is finished in corrosion and heat-resistant enamel. Three separate and distinct types of insulation are so utilized as to minimize heat loss and maintain even temperatures. Heavy gauge nickel chromium heating coils held in refractory supports line the chamber uniformly.

Thermo Electric Mfg. Co., Dept. PVP, 559 Huff St. Dubuque, Iowa.

VISCOSITY TUBES
Bubble Time Method

ASTM "timer" tubes are made of clear glass. One end is open, the other has a flat bottom. The inside diameters of these tubes are held within a tolerance of 10.65 ±0.025 mm. Outside length equals 114 mm. ±1 mm. Plainly legible rings are located at distances from the bottom as follows: 27 ±0.5 mm.; 100 ±0.5 mm.; 108 ±0.5 mm.

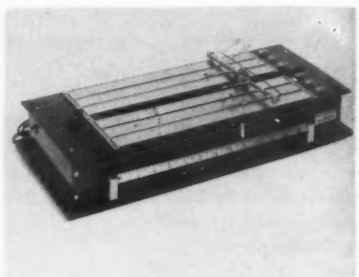
The distance between the first and second ring is 73 ±0.5 mm. The bubble speed of the liquid is timed between these two rings. The distance between the second and third ring is 8 mm. ±0.5 mm. These rings are used as guides to form a bubble of proper size.

A special revolving tube holder is available for use with the tubes. After filling and corking the tube, it is placed in the holder and retained by means of two spring clips. The tube holder, which is constructed of all nickel-plated brass, is then immersed in the water bath. To invert the tube, pull the plunger knob upward.

Leveling of the tube holder is accomplished by means of built-in adjusting screws and a bubble level.

Positioning of the tube in the true vertical is mandatory. A tube one radious off the vertical will give results that are 8-10% lower. If the tube is one diameter off the vertical, the results will be 20-25% lower.

Gardner Laboratory, Inc., Dept. PVP, P. O. Box 5728, Bethesda 14, Md.



EASTERN PRECISION

DRYING RECORDER
To Measure Drying Time

A drying recorder device, by which scientifically precise measurement of drying time of any paint, varnish, lacquer, enamel or other chemical products, is now available.

This instrument is portable and compact enough to be used with auxiliary equipment to vary the atmospheric conditions under which drying takes place. To measure the drying time, films of the materials to be tested are applied with a specially designed film coating gage to one and up to six of the metal specimen strips available which are then placed on the table of the recorder. On each of the strips coated, a hemispheric needle is brought to bear down by means of a movable carriage to which a time indicator is attached. After indicator is brought to zero on the time scale, a 110 v. synchronous motor draws the carriage along the length of the strips, making tracks

in the film being evaluated. Through the use of a three speed gearbox, the total travel of the needles can be set to occur in 8, 16, or 24 hours so that the drying time of the quick and slow drying materials alike can be more accurately determined.

Different stages of the drying process are registered and data on other physical properties of the film, i. e. adhesion through drying, and tendency to wrinkle are recorded.

Eastern Precision Tool & Gage Co., Dept. PVP, 451 Lehigh Ave., Union, N. J.

ELECTRON MICROSCOPE
Magnifies Two Million X

The Norelco EM 200 electron microscope, an instrument that provides 200,000X direct magnification and up to 2,000,000X magnification by photographic methods, has been announced.

Resolving power of 10 Angstroms or better is guaranteed. The instrument provides 1400 to 200,000X direct magnification for visual observation on the screen or for photographic recordings on 3¼" x 4" plates. Such photos can be easily enlarged to 2,000,000X magnification. Direct magnifications of 700 to 100,000X can be made on 35mm film and 100X can be handled with an adaptor. Direct magnifications are indicated or recorded with an accuracy of plus or minus 5% and the full range is obtained with a single set of pole pieces.

Consisting of a desk-type console and auxiliary cabinet, the EM 200 utilizes accelerating voltages of 40, 60, 80 and 100 Kv (Kilovolts) which may be charged during operation. The desk console supports the column and houses the controls and pumping system. An auxiliary cabinet encloses the power supply and stabilization units.

Electron optical system includes a vertical column having six electromagnetic lenses: double condenser, objective, two intermediate, and projector. The double condenser lens has an independent compensator and easily adjustable electromagnetic centering device.

The minimum attainable beam diameter is 1-2 micron on the specimen. Wide field scanning permits rapid specimen examination at 300X magnification.

The EM 200 electron microscope desk is 47 in. wide, 42 in. high and 32½ in. deep. Column and high tension cable are 53½ in. high. Auxilary cabinet is 43½ in. wide, 75 in. high and 24 in. deep. The instrument can be operated on single phase, 50 or 60 cycle power supplies with 110 to 440 volt ratings. Energy consumption is approximately 3.5 Kva.

Instruments Division, Philips Electronics, Inc., 750 South Fulton Ave., Mount Vernon, N. Y.

LIFT TRUCK
24-Volt Power

A warehouser, narrow aisle, electric powered lift truck, incorporating a 24-volt electrical system, has been made available.

The new trucks are built in 2000, 3000 and 4000 pound capacity straddle-stacker models, all of which work comfortably in aisles less than six feet with normal loads.

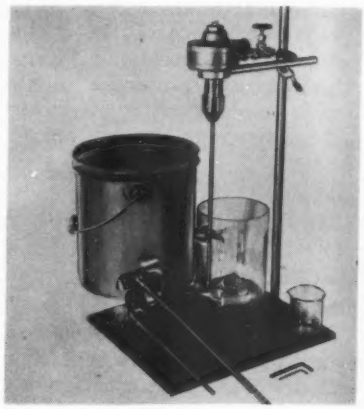
Lifting channels are welded solidly to the main frame of the Warehouser. The outrigger legs are joined to the base of the frame through a long weld which provides support back through the bulk of the frame section.

Access doors exposing components for service are hinged in positions of protection from bumping in normal truck operation. Points on the truck which are subject to contact with outside objects are all soild steel plate, impervious to operational damage.

By providing the direction indicator, the truck is never apt to be maneuvered into a tight situation where excessive power draw is necessary to move against the action of the steer wheel in order to resume normal operation. The direction indicator also permits the operator to put the truck in motion immediately upon boarding without having to first determine which way the steer wheel is pointed.

Another standard feature on the new Warehouser is the placement of an operating hour meter in the dashboard of the truck. By affording a quick means of determining the exact amount of operation of the truck in a given time, the meter can serve as a guide to the most effective truck utilization for the user.

Yale & Towne Manufacturing Co., Dept. PVP, 11,000 Roosevelt Blvd., Philadelphia 15, Pa.



FAWCETT

STIRRER
Air-Driven

Laboratory air–driven stirrers now being offered. The unit is air operated from 30 to 90 lbs. pressure and is claimed to meet all safety requirments.

The unit has needle valve control. A turn of the hand wheel gives the exact speed required, from 40 to 2000 R. P. M. High torque at low speeds is claimed.

The stirrer, by slowly opening needle valve, can be brought to desired speed without sudden jump in R. P. M. Unit can be stalled indefinitely without damage to motor and without heat.

M. W. Fawcett Co., Dept. PVP, Macedonia, Ohio.

BENCH CAN
Spring-Actuated Dasher

The problem of cleaning small metal parts in gasoline said to be solved by a new safety bench can.

To minimize waste and speed the operation of cleaning small parts or swabbing larger ones, the firm has designed special features into the new can approved by Factory Mutual for industrial use. It has a spring-actuated dasher which is perforated and flush with the top of the can, to reduce evaporation losses and minimize

explosive vapors. The dasher, coupled with baffles, protects contents of the can from fire. The entire can is constructed of heavy-gauge coated sheet steel, with red enamel exterior finish.

The safety bench cans are available in one- and two-quart and two-gallon sizes.

Eagle Manufacturing Co., Dept. PVP, 3032 Charles Street, Wellsburg, W. Va.

HYGROMETER

To Indicate Humidities

A new, portable Electro-Hygrometer that can indicate relative humidty electronically from as far as 100 feet away is now available. No tubes are used and readings are almost instantaneous. Furthermore, it is claimed to give faster, more accurate results. No conversion charts or thermometers are needed.

The small, lightweight hydrometer is capable of indicating humidities from 30% to 95%, within a temperature range of 32°F to 180°F, by simply turning a knob. It operates with an accuracy of ±5%.

The Electro-Hygrometer said to be particularly useful for detecting dangerous humidity levels whever perishables are stored. In addition, due to its remore measuring feature, it can be used to determine humidity inside of difficult locations such as stacks of paper, grain bins, etc. The unit also has considerable application in monitoring humidity conditions in the plant and laboratory where hydroscopic materials are used. Another important use is for checking humidity as a control on the rate of corrosion.

A wide variety of probes are available. They can be furnished in regular shapes or in long, flat shapes to handle special interior applications.

It has a sensitive AC electronic circuit with a meter housed in a sturdy, Bakelite case. The panel control has a three position switch: check, off, and read. When set on a check position, the meter reading is adjusted to 100 per cent to compensate for any variations.

A temperature correction factor for registering above or below 82°F is listed on the instrument. Otherwise, the results in per cent of relative humidity are read directly from the meter.

Labline Inc., Dept. PVP, 3070-82 W. Grand Ave., Chicago 22, Ill.

PALLET TRUCK

Three Rated Capacitites

Multiton pallet truck, built by the Steinbeck works in West Germany, designed to meet needs of U. S. Industry.

A major feature of the multiton pallet truck contributing to high durability and low maintenance is the hydraulic unit, which is a single machined part containing both the lifting cylinder and the fluid reserve cylinder, with fluid flowing through passages bored in the casting itself. There are no tubes, no interior gaskets or packings. Since both cylinders are contained within the single housing, which also contains the reservoir, there can be no leakage of hydraulic fluid. This fluid supply said to last indefinitely, flowing back to the reservoir through the machined channels when it is not needed in the lifting cylinder.

The Multiton Pallet Truck is made in three rated capacities: 2200 lbs., 3500 lbs., and 4400 lbs.

Stokvis*Edera and Co., Inc., Dept. PVP, 18 Secatoag Avenue, Port Washington, New York.

Will your emulsion paint look this good after 1 year?

If you use RHOPLEX AC-33 it will. That's because this 100% acrylic emulsion provides pH stability that helps prevent can corrosion and protects paints against viscosity changes. The original viscosity of the paint in the picture was 78 Kreb units—one year later it was 74, essentially unchanged.

This stability is an advantage to paint manufacturers in other ways too. For example, the emulsion can be processed by pebble, roller or colloid mills without danger of coagulation or emulsion breakage. Tanks and equipment are easy to clean. RHOPLEX AC-33 withstands repeated freezing and thawing, a benefit that carries over to the finished paints. Compatibility with a wide range of white pigments and colors means bright clean paints. With RHOPLEX AC-33, one vehicle can be used to produce both interior and exterior finishes, color retentive and durable.

Full information on formulating stable emulsion paints will be sent promptly on request.

Chemicals for Industry

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

RHOPLEX is a trademark, Reg. U.S. Pat. Off. and in principal foreign countries.

RHOPLEX AC-33

PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

Aminoplast Resin Coating Compositions

U. S. Patent 2,871,209. James P. Shelley, Drexel Hill, Pa., assignor to Rohm & Haas Co., Philadelphia, Pa., a corporation of Delaware.

A composition comprising a solution, in an organic solvent comprising an alcohol having 3 to 6 carbon atoms, of a long-oil alkyd resin, a butylated dimethylolurea, and the monosalt of maleic acid with triethylamine, the concentration of alkyd and butylated dimethylolurea being from about 1 to 50% by weight, there being present 30 to 40 parts by weight of butylated dimethylolurea, 70 to 60 parts by weight respectively of the alkyd and about 1 to 3 parts by weight of the monosalt.

Silicone Coating Compositions

U. S. Patent 2,868,657. Louis M. Sesso, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

A surface finish composition consisting essentially of an organopolysiloxane having predominately a combination of substantial amounts of both methyl and ethyl groups attached to the silicon atoms of each organopoly-siloxane molecule, said organopolysiloxane having a viscosity of between about 20 and about 15,00 centistokes at 25°C., a liquid organic solvent entirely miscible with said organopolysiloxane having an aniline point between about 50°F. and about 185°F. and a distillation range of between about 190°F. and about 460°F., and a wax in a quantity up to about 10 parts by weight per each part by weight of polysiloxane, the ratio of said solvent to said wax and said polysiloxane being such that the solvent functions as a mutual solvent-dispersant for the polysiloxane and wax permitting said composition to be readily applied to surfaces in thin evenly distributed films.

Drying Oils

U. S. Patent 2,871,135. Josef Weiss, Vallingby, Sweden, assignor to Richard Nilsson Aktiebolag, Stockholm, Sweden, a corporation of Sweden.

A drying oil comprising a mixture of glyceride of a higher fatty acid and a synthetic oil obtained by condensing two moles of a fatty acid selected from the group consisting of unsaturated higher fatty acids and mixtures of unsaturated higher fatty acids with saturated higher fatty acids with one mole of an aluminum compound prepared by reacting one mole of aluminum alcoholate and one mole of an enolic compound selected from the group consisting of acetoacetic ester, malonic diethyl ester and acetonyl acetone.

Plasticized Polyvinyl Chloride

U. S. Patent 2,867,598. Joachim Dazzi, Dayton, Ohio, assignor to Monsanto Chemical Co., St. Louis, Mo., a corporation of Delaware.

A resinous composition comprising polyvinyl chloride plasticized with an addition product of turpentine and a dicarboxylate selected from the class consisting of alkyl fumarates and maleates having from 1 to 8 carbon atoms in the alkyl radical, said addition product having a boiling point of below 200°C. at a pressure of less than 2 mm. of mercury.

Lacquer Composition

U. S. Patent 2,865,870. Raymond G. Pinder, Rochester, N. Y., assignor to Eastman Kodak Co., Rochester, N. Y., a corporation of New Jersey.

A heat hardenable lacquer composition, the essential constituents of which comprise in a solvent of an epoxide resin, a polyamide resin, and a cellulose acetate butyrate.

Epoxy Coating

U. S. Patent 2,870,117. Henry A. Vogel and Harold G. Bittle, Gibsonia, and Roger M. Christenson, Richland Township, Pa., assignors to Pittsburgh Plate Glass Company.

A heat hardenable resinous composition comprising a polyglycidyl ether

of a polyhydric compound, and an interpolymer of an acrylamide with at least one other monomer having a $CH_2=C<$ group, said interpolymer being characterized by having amido hydrogen atoms replaced by the structure

$$—ROR_1$$

wherein R is a saturated lower aliphatic hydrocarbon radical, and R_1 is a member of the class consisting of hydrogen and lower alkyl radicals.

Stabilized Vinyl Chloride Resin

U. S. Patent 2,867,594. Floyd R. *Hansen, Bedford, and Baruch Zaremsky, Cleveland, Ohio, assignors to Ferro Chemical Corp., Bedford, Ohio, a corporation of Ohio.*

Polyvinyl chloride resin stabilized with 0.1 to 20 parts, per 100 parts of resin, of diphenyl mono-2-ethyl hexyl phosphite.

Vinyl Coating

U. S. Patent 2,870,116. Henry A. Vogel and Harold G. Bittle, Gibsonia. Pa., assignors to Pittsburgh Plate Glass Co., Allegheny County, Pa., a corporation of Pennsylvania.

A heat hardenable resinous composition comprising a polymer of a vinyl halide, and an interpolymer of an acrylamide with at least one other monomer having a $CH_2=C<$ group, said interpolymer being characterized by having amido hydrogen atoms replaced by the structure

$$—ROR_1$$

wherein R is a saturated lower aliphatic hydrocarbon radical, and R_1 is a member of the class consisting of hydrogen and lower alkyl radicals.

Phthalocyanine Pigments

U. S. Patent 2,867,539. Robert E. Brouillard, Westfield, and Leon Katz, Springfield, N. J., assignors to General Aniline & Film Corp., New York, N. Y., a corporation of Delaware.

A blue phthalocyanine pigment composition consisting essentially of a copper phthalocyanine and about 0.5 to 5% of an alkaline earth metal salt of sulfonated zinc phthalocyanine, containing about 1.25 to 2.5 sulfonic acid groups per zinc phthalocyanine molecule by weight of said copper phthalocyanine.

Oil Soluble Butenylphenol Formaldehyde Resins

U. S. Patent 2,871,208. Roger M. Christenson, Whitefish Bay, and Lowell O. Cummings, Milwaukee, Wis., assignors to Pittsburgh Plate Glass Company.

A light colored varnish composition consisting essentially of the product obtained by heating together a drying oil and the resinous condensation product of formaldehyde and a mixture of butenylphenols containing about 55

percent to 85 percent by weight of ortho- and para-monobutenylphenols, and about 15 percent to 45 percent by weight of di- and tributenylphenols.

Coating Vehicle

U. S. Patent 2,867,593. Russell T. Dean, Stamford, Conn., and Rupert J. Schefbauer, Hasbrouck Heights, N. J., assignors to Interchemical Corp., New York, N. Y., a corporation of Ohio.

A vehicle for the coating industry characterized by rapid dry and good color retention, comprising the product formed by (*a*) reacting an alkyd resin forming polyhydric alcohol having at least three hydroxyl groups with a material of the group consisting of glyceride drying oils and drying oil fatty acids, at a relatively high temperature, to form an ester having free hydroxyl groups and (*b*) reacting the ester so obtained at a substantially lower temperature with an alkyd resin forming dicarboxylic acid consisting essentially of alpha-beta unsaturated acid and a monohydric alcohol which is 2-5 endomethylene △-3 tetrahydrobenzyl alcohol, to an acid number below 35, the monohydric alcohol being present in the ratio of 0.8 to 1.1 mols per mol of dibasic acid, and the monohydric alcohol and drying oil acids together being present to a total of about 1.5 to 3.0 mols per mol of dibasic acid.

Water Repellent Coating

U. S. Patent 2,873,202. Francis E. Chapman, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

A permanent coating composition of the class comprising an organic paint and varnish coating resin dissolved in an organic solvent therefor characterized by improved water repellency and mar and abrasion resistance, said composition having dissolved therein 0.25 to about 10% by weight, based on the resin content, of a synthetic wax compatible with said resin, said synthetic wax being a saturated straight-chain dialkyl ether wherein each alkyl radical contains from 12-32 carbon atoms.

Lacquering Rubber Articles

U. S. Patent 2,874,068. Franz von Spulak, Leverkusen-Bayerwerk, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, a corporation of Germany.

A process for lacquering rubber which comprises initially treating the rubber with a solution of a poly-functional isocyanate, evaporating the solvent from said solution, applying a solution of a hydroxyl polyester having an hydroxyl number of from about 30 to about 450 and an acid number of from zero to about 40 to said treated article and effecting a reaction between said isocyanate and said hydroxyl polyester.

Self-Hardening Surface Coating Compositions

U. S. Patent 2,874,080. Otto Schweitzer, Frankfurt am Main, and Erich Bader, Hanau am Main, Germany, assignors to Deutsch Goldund Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany.

A method of adhering a self-hardening polymeriable coating composition to a metallic surface selected from the group consisting of copper, zinc copper alloys and zinc alloys which comprises applying to said surface a self-hardening polymerizable coating composition containing at least one liquid polymerizable organic compound containing a terminal $CH_2=C<$ group and a relatively small but effective amount of at least one compound capable of forming a complex with copper and zinc selected from the group consisting of hydroxy quinoline, acetyl acetone and benzoyl acetone to improved the bond of the coating composition to said metallic surface.

Curing Air Blown Oils With SO_2

U. S. Patent 2,872,345. Ober C. Slotterbeck, Clark, and Merilyn A. Tucker, Cranford, N. J., assignors to Esso Research and Engineering Co., a corporation of Delaware.

A process for improving the hardness of films prepared from synthetic hydrocarbon drying oils which comprises first reacting the oil at a temperature between 20° and 280°F. with oxygen, applying a film of oil to a surface, then reacting the oxidized oil with the reaction product of molar equivalents of trimethylolpropane and tolylene diisocyanate to produce a cross-linked oil, and finally subjecting a film of the resulting cross-linked oil to the action of sulfur dioxide at room temperature.

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TECHNICAL Bulletins

PLANTS & FACILITIES

A 12-page illustrated booklet describing the plants, facilities and major products of the firm has been made available by Catalin Corporation of America, Dept. PVP, One Park Avenue, New York, N. Y.

Of particular interest is the description of Catalin's laboratories where large staffs of scientists and technicians delve into the problems of basic research, new product development, standard product improvement and customer projects.

Entitled *Catalin—Chemicals, Resins, Plastics*, the booklet provides important information on many of the firm's products and their applications. Antioxidants, bacteriostats and a number of other chemicals are discussed, as are both thermosetting and thermoplastic industrial resins.

Information is also given on various formulations and grades of styrene, nylon and polyethylene plastics.

FLOOR COATING

The features and advantages of Whistl-Phane, a new non-wax, extra-safe floor coatings, are presented in a brochure made available by the Whistlclean Corp., Dept. WP-PVP, 404 Fourth Avenue, New York 16, N. Y.

Described as exceptionally slip-resistant, Whistl-Phane is recommended for the maintenance of composition floor surfaces (asphalt, vinyl, rubber, linoleum, vinyl asbestos, etc.). The new folder tells how Whistl-Phane, which is formulated from plastics used in the manufacture of thermo-plastic sheets, tubes, bags and similar flexible products, dries quickly to a self-polishing, tough finish, that will outwear conventional water emulsion wax films.

The folder further describes how Whistl-Phane, unlike many plastic coatings, can be easily and quickly removed.

Detailed information on the slip-resistance of the product, application, and coverage data are provided. Also, there are illustrations of the typical installation of the product, as well as complete data on how to use Whistl-Phane for easy, economical floor maintenance.

BUTENEDIOL

A revised and enlarged technical bulletin on 2-butene-1,4-diol has been issued by the Commercial Development Department, General Aniline & Film Corp., Dept. PVP, 435 Hudson Street, New York 14, New York.

The bulletin describes the physical properties of butenediol and outlines the major types of chemical reactions in which it can take part. These include esterification, reaction with halogens, nitration, ether formation, ring closure by dehydration or by condensation with amines, Diels Alder reactions, epoxidation, copolymerization and isomerization.

The bulletin also includes a brief discussion of the applications of butenediol derivatives in uses such as pesticides, drugs, textile assistants, plastics and resins, solvents, plasticizers and lubricants.

FURNACE FUME CONTROL

Control and collection of dust and fume from electric steel furnace installations is covered in a new 16 mm. color, sound movie produced by Whellabrator Corp., Dust

and Fume Division, Dept. PVP, 1231 S. Byrkit Street, Mishawaka, Indiana. The 20-minute film is available for program use in plants and at meetings of professional societies and organizations.

A complete discussion of the desirability and advantages of control of fume from electric furnaces is presented. Diagrams and commentary are combined with photography of actual installations of Wheelabrator dustube fume control systems illustrating three types of hooding with the operation and advantages of each demonstrated.

URETHANE COATINGS

A new technical bulletin, describing the formulation of urethane coatings for application to wood surfaces, has been published by Mobay Chemical Co., Dept. PVP, Pittsburgh 34, Pa.

The information has been prepared to assist paint companies in formulating and applying the durable urethane coatings by brush, spray or roller methods to furniture, laboratory tables, hardwood floors, bowling alleys, ballrooms, boat hulls and similar surfaces where high resistance to abrasive and impact wear is essential.

The new literature supplements a series of technical bulletins published by Mobay which describe the formulation, properties and application of urethane coatings for concrete and metals.

Complete technical data are provided, including information on special force-dry bake systems and effective bodying agents.

COATINGS

The Resinous Products Division, Rohm & Haas Co., Dept. PVP, Washington Square, Philadelphia 5, Pa., has announced the release of two new booklets in the coatings field.

The 22-page "Duraplex and Amberlac" booklet on alkyd-type resins deals with baking, air-drying, and non-drying alkyd coatings. Tables of physical properties, uses, typical performance data, and many suggested formulations are compiled with specific data on individual grades of these resins.

The "Uformite" booklet considers the urea-melamine and urea-triazine solutions which are used in formulating heat setting protective coatings characterized by fast curing, high gloss, and excellent chemical resistance and durability.

With the tables of physical characteristics, compatabilities, and uses, the 18-page booklet discusses the several Uformite grades as they apply to such diverse fileds as furniture finishes and baking varnishes. The six-page formulation section should prove of practical assistance to coatings manufacturers and coatings laboratories.

A-C MOTORS

A new Reliance a–c, motor selector booklet, Bulletin B-2103-4, giving concise selection data to users of a-c. motors from one through 200 hp has been published by Reliance Electric and Engineering, Co., Dept. PVP, 24701 Euclid Avenue, Cleveland 17, Ohio.

Include in the twelve-page booklet are brief explanations of NEMA design classes, speed-frequency relationship, current and torque values, as well as frame selection tables and complete dimension information for standard frames and mechanical modifications for all frame sizes from 182 through 6085.

Additional photos illustrate special-purpose motors made by Reliance for use in unusual temperatures or atmospheres.

LITERATURE INDEX

The new Honeywell Index of Literature, G2-1a, has been made

available by the Minneapolis-Honeywell Regulator Co., Industrial Division, Dept. PVP, Wayne & Windrim Avenues, Philadelphia 14, Pa. This 24 page bulletin lists Industrial and Valve Division literature. *Product Catalogs* contain operating principles, instrument characteristics, application data, general specifications and ordering information. *Specifications* provide detailed specifications on an instrument or series of instruments. *Technical Bulletins* deal with fundamental studies of instrumentation, and engineering aspects relating to application of an instrument to a specific process or industry. *Industry Bulletins* cover instrumentation as applied to an entire industry. *Systems Bulletins* describe instrumentation concerning a particular system. *Instrumentation Data Sheets* report actual application of instruments on particular processes in specific industries.

A complete alphabetical subject-company index of *Instrumentation* magazine articles is included. In addition, educational aids and other Honeywell services and literature are described.

VARIABLE-SPEED DRIVES

A new eight-page bulletin, G-5812, describing the complete line of variable-speed drives which provide precise, infinitely adjustable output speeds from a constant rpm. motor source operating from standard in-plant a-c. circuits, has been made available by Reeves Pulley Co., Division of Reliance Electric and Engineering Co., Dept. PVP, Columbus, Indiana.

The bulletin includes mechanical construction features, condensed drive specifications, available speed variations and accessories for the Reeves vari-speed motodrive, motor pully and variable-speed transmission.

SILICONE INTERMEDIATES

A 12-page data sheet on silicone intermediates for modifying organic resins has been made available by the Silicones Division, Union Carbide Corp., Dept. PVP, 30 E. 42nd St., New York 17, N. Y.

The data sheet features discussions on the following areas: High heat resistance; improved weatherability; wide variety of starting materials; properties can be "tailor-made" by careful selection of starting materials; and no additional outlay for processing equipment.

ISOBUTYLENE

Petro-Tex Chemical Co., Dept. PVP, P. O. Box 2584, Houston 1, Texas, has issued what is believed to be the first comprehensive isobutylene "family tree," graphically showing present commercial uses and all reported reactions having potential new-product significance.

Accompanying this 17" x 22" chart is a bibliography of 213 literature references, keyed to the chart so as to facilitate the exploratory work of research and product-development men.

WRINKLE FINISHES

Two new bulletins have been made available by the Union Carbide Plastics Co., Division of Union Carbide Corp., Dept. PVP, 30 E. 42nd St., New York 17, N. Y.

"Vinyl Wrinkle Finishes," a five-page technical bulletin describing the use of vinyl plastisols, organosols and solutions in the formulation of vinyl wrinkle coatings, has been released.

Described by the company as Coatings Technical Release No. 40, the new bulletin explains advantages and suggests formulations of using plastisols, organosols and solution coatings in preparing vinyl wrinkle finishes.

A new, three page bulletin describing the cold-mix technique and

formulations for producing wrinkle-resistant phenolic varnishes has also been made available.

The new bulletin, Coatings Technical Release No. 39, explains performance and properties of wrinkle-resistant cold-mix varnishes.

MILLIVOLTMETERS

A 28-page catalog covering operating principles, specifications, features, and ordering information on non-control and control millivoltmeters has been made available by the Minneapolis-Honeywell Regulator Co., Industrial Division, Dept. PVP, Wayne & Windrim Avenues, Philadelphia 44, Pa.

The catalog, C10-1, includes information on all control models such as Pyr-O-Vane, pulse Pyr-O-Vane, Protect-O-Vane, and the Pyr-O-Volt controller.

WET GROUND MICA

"Stability and Moisture Resistance of Latex Paints Influenced by Wet Ground Mica" is the subject of the latest Technical Bulletin No. 38 published by the Wet Ground Mica Association, Inc., Dept. PVP, 420 Lexington Avenue, New York 17, N. Y.

The studies reported in this bulletin show that wet ground mica increases moisture resistance and lessens color change, indicating greater stability. Besides using the water vapor loss tests reported in earlier bulletins and studying the Weather-Ometer behavior of the test paints, the test paints were applied to fabric.

The film coherence or the resistance to cracking of the paint films were studied visually and impact test were made. In storage and application conditions, the mica showed greater stability and less effect on the stability of the latex itself, which is an important factor.

With this bulletin, the Association is enclosing a questionnaire to determine any technical data that might be desired by users and potential users of wet ground mica.

Those desiring a binder to file the technical bulletins may have one without charge and are asked to enclose a self-addressed label for mailing purposes.

VINYL-LATEX PAINT

Increased durability in a wide variety of climatic areas, made possible by new coating formulas based on Bakelite vinyl resin has been announced in a new bulletin by Union Carbide Plastics Co., Division of Union Carbide Corp., Dept. PVP, 30E. 42nd St., New York 17, N. Y.

The bulletin, Technical Release No. 18, provides four basic formulas developed as a result of over six years experimentation and exposure with vinyl acetate latex WC-130.

The information is contained in eight pages that include the manufacturing procedure for each formulation; chalk-resistant white (for tints), white, green and red exterior paints.

DIMER ACID

A new 28-page compilation of abstracts of patents and journal references on dimer acid is being offered by Emery Industries, Inc., Dept. 5—PVP, Carew Tower, Cincinnati 2, Ohio. Technical Bulletin No. 412 contains abstracts of 113 United States Patents and 27 published articles dealing with the use and application of the acid, which is a mixture of relatively high-molecular-weight dibasic and tribasic acids.

Fields of use covered by the patents and articles include polymers, surface coatings, urethane foams, rust inhibitors and viscosity improvers for lubricants, synthetic fibers, waxes and adhesives, among others.

ALKYD GRAPH *(From page 36)*

Another vehicle finding possible use in product finishes is one based on isopthalic acid with technical trimethylolethane. This vehicle is processed easily by solvent procedures. Since the usual resin for these applications has a viscosity in the range of X at 60% in xylol, the formulation which approximates this most closely is IPA/TME/FA = 0.88/1/0.6. Note that this composition on the graph is below the gelation curve for TME-IPA. (The lower level of isophthalic content permitted has been discussed in the early part of this article).

Appliance and Automotive Finishes

The usefulness of the composition graph is by no means limited to tall oil fatty acids. It can be used also with saturated types including lauric and pelargonic, and semi-drying such as cottonseed and soy. All find use in appliance and automotive coatings.

Baking Type Short Alkyd—The high standards of color and gloss retention, heat stability, and resistance properties demanded in present day quality coatings can be readily met with trimethylolethane-saturated fatty acid (lauric, pelargonic)-phthalic alkyds. The viscosity, solvent, and performance required in such applications recommend the use of a PA/TME/FA = 1/1/0.5 alkyd formulation. This composition is within the gel free range as indicated by the graph.

These resins have excellent compatibility with various amino resins. In addition, the improved solubility of TME vehicles in lower solvency diluents permits a wide choice of solvents.

Air Dry and Baking Alkyd—Where high quality must be balanced with low costs, a formulation based on the PE-glycol combination with tall oil fatty acids is a logical choice. The basis of the formulation is similar to that described previously but the final formulation on the molecular basis is PA/PE-glycol/FA = 1/0.5-0.5/0.5. The processing details are similar to the previous PE-glycol resin but the final temperature of reaction is 220° C.

TME-PE Resin—With the use of the approach suggested above for mixtures of PE and glycol, it is also possible to prepare mixtures based on PE and TME.

The formulation is set up by assuming that two independent resins are made, each modified by tall oil fatty acids.

a) PE alkyd is chosen at PA/PE/FA = 1/1/0.9
b) TME alkyd is chosen at PA/TME/FA = 1/1/0.3

Then one part (a) + two parts (b)
Total PA/PE-TME/FA = 3/1-2/1.5 or dividing by three = 1/.33-.67/.5

In the actual preparation all of the ingredients are charged to the kettle simultaneously, and the resin is cooked at 245° C. to yield a non gelled system at an acid number of 9. The resulting resin viscosity is Z_2 at 50% N. V. in xylol.

TME is the registered trademark of Heyden Newport Chemical Corporation for Trimethylolethane.

Bibliography

1. Kraft, William M., "The Molecular Approach to Alkyd Structure", Official Digest **29**, #391, 780 (August 1957).
2. Kraft, William M., Roberts, George T., Janusz, Edward G., and Weisfeld, Joseph. "High Polymer Alkyd Technique", American Paint Journal **41**, #28, 96 (March 25, 1957).

CYCLIZED RUBBER

(*From page 47*)

The compositions shown in section B must be considered to be of limited chemical resistance, and are suitable for application mentioned under group B. They may be exposed for a long period of time to water, weak acids, salt solutions, etc., but only for short times to alkalies from several hours or days depending on the quantity of the alkyd resin used. Such binder compositions can be used as waterproof exterior paints in textile mills, paper mills, breweries and dairies.

It must be also mentioned again that the utilization of certain film formers drying through crosslinking film formation such as in the amounts of 40% or more noticeably improve the resistance against oils, fats, aliphatic hydrocarbon solvents. Specialties intended for such purposes should only contain small quantities of plasticizers, because they reduce oil and grease resistance.

The outside durability, especially gloss retention during outside exposure, generally increases with the increasing alkyd resin portion—considering here the mixture indicated in the triangle diagram. But not only the alkyd resin portion, but also the quantity of the plasticizer used keeps the gloss retention. An increase of plasticizer and keeping the alkyd resin at a constant level improves the durability during outside exposure. The composition in section D has the best weather resistance and can be utilized for coatings where outside durability is of predominant importance. (see suggested applications outlined in group).

For applications under mild conditions, alkyd rich compositions are recommended, and for severe conditions compositions containing less alkyd resin are suggested. A stronger reduction of the alkyd portion leads into section C. Compositions of good weather resistance and relatively high chemical resistance comprise applications suggested in group C.

The above remarks refer to the behavior of binder combinations for one coat systems. If several coats are applied, the outside durability of the entire paint system may depend on other factors such as pigmentation, drying, crosslinking and the resulting bond between the various coats of the system. In place of or in combination with alkyd resins, drying oils can often be utilized. Basically it must be mentioned that the resistance is influenced by the water resistance of the oils which is usually inferior to the resistance of alkyd resins, with the exception of woodoil.

Generally, a pronounced change of outside durability occurs if alkyd resins are replaced with drying oils. This results in poorer durability.

It is to be understood that the triangular diagram suggests only possibilities of compositions of "Alpex" varnishes, and that in each case the properties of each part of the binder composition, especially their compatibilities with "Alpex", must be considered.

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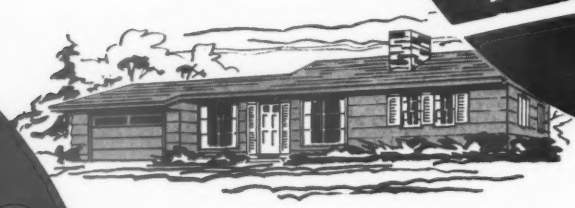

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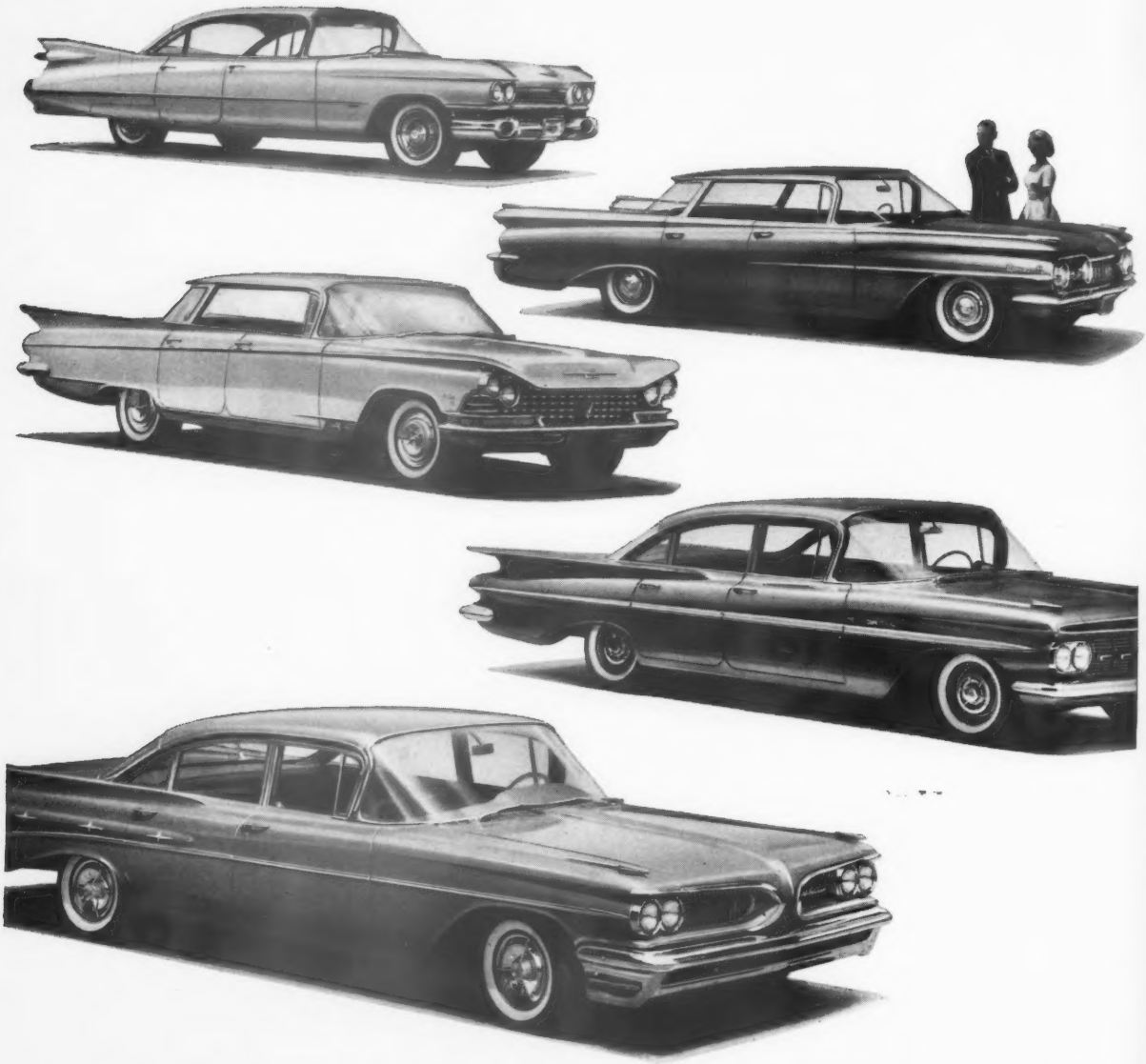
foreign developments

Anticorrosive Paint System Development in Sweden

Recent Soviet Developments

Large scale test of anticorrosive paint system on a lumber conveyor showed good results in an area near a papermill where harsh chemical fumes are prevalent. See page 89 for this Swedish development.



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ANTI-CORROSIVE PAINT SYSTEM for MAINTENANCE APPLICATIONS

Successful large scale tests have recently been carried out in Sweden with new anti-corrosive paints which give the same protective thickness with two coats—namely one of primer and one top coat—as was previously obtainable only with four applications of conventional paint.

Because the protective quality of anti-corrosive paint depends largely on achieving a paint film of sufficient thickness—approximately 6 mils—which is usually obtained by applying four coats, AB Wilh. Becker, paint manufacturers in Stockholm, were interested in the economic advantage of a paint which would reduce the number of coats necessary and, therefore, the cost of labor.

In 1954 this company started work on thixotropic paints. During their investigations they learned that by using thixotropic binders they could obtain this result.

In 1958 the company, after intensive research, produced a red lead paint "Plomb-monja" which will produce a dry thickness of 3-4 mils without sagging, with only one application.

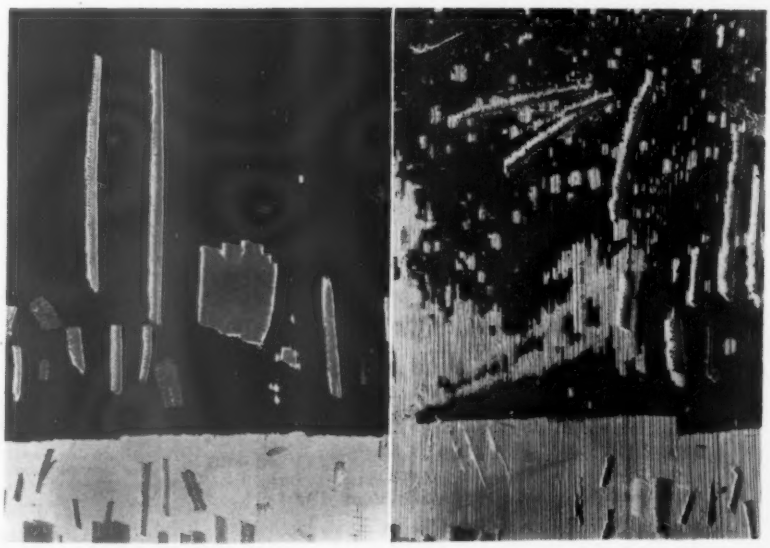
The production of this paint did not involve merely making existing anti-corrosive paints in a thixotropic form. There were additional problems to consider. For instance, what particular type of binder to use, the degree of thixotropy, and if this state would interfere with the corrosion resistance of the paint.

Testing

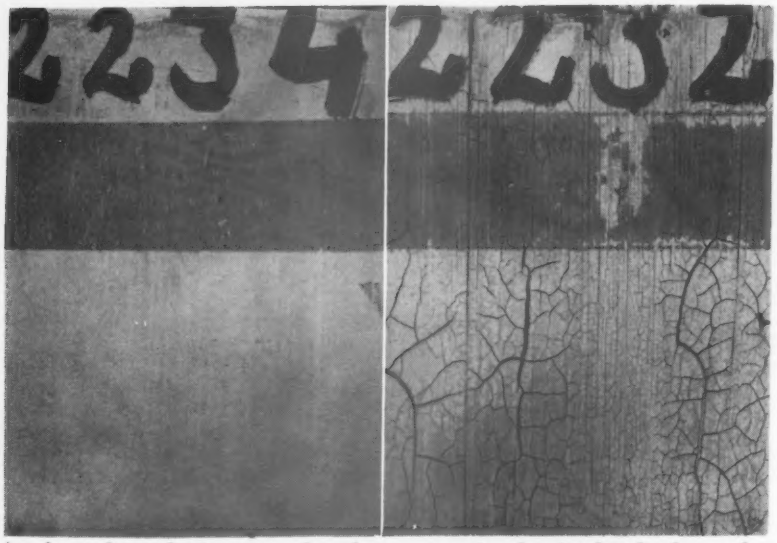
The answers were found after intensive research using laboratory as well as practical tests. The paints were tested in corrosion chambers with sulphur dioxide, carbon dioxide and water, in Weather-O-Meters, in salt spray equipment, and by immersion in distilled water at 40 degrees Centigrade. This was in addition to the usual tests for drying properties, hardness at various film thicknesses, wetting properties, adhesion, elasticity and adhesion for covering paints.

As the final part of the practical tests, this paint was used on railway bridges, viaducts and other outdoor construction work. In all these tests the paint has proved itself to be very satisfactory.

Although the paint is mainly oil-based, it dries without wrinkling in thick applications, and it has the additional advantage of not producing brush marks to the same extent as normal red lead oil paint. This factor increases its anti-corrosive properties for it is in the "valleys" of the brush marks



Comparing adhesion properties of top coat after immersion in water. Left Panel: dark portion show where the top coat has been applied over the new red lead paint "Plomb-monja". Right Panel: when applied over conventional red lead paint. The lighter spots are scratch tests made by knife after water test. Brush marks are clearly visible on the conventional red lead paint.



Accelerated weathering tests show how conventional paint breaks down after exposure to sunshine. "Plomb-monja" is still intact after 1000 hours exposure (left panel). The conventional red lead paint has cracked after 400 hours exposure (right panel).

that rust very often gets a grip. The paint has also exceptional covering powers on sharp edges which are most susceptible to corrosion.

Because of its thixotropic character, it is also possible to take more paint on the brush and to use larger sizes of brushes. This means that, in addition to the possibility of achieving enough film thickness with half the number of applications, the resultant savings in the cost of labor more than compensates for the increased price of the new paint as compared with conventional red lead paint.

The company has also produced a calcium plumbate primer with the same application properties as "Plomb-monja" but with the additional advantage of being suitable for use on galvanized steel. The primer makes use of the anti-corrosive properties of calcium plumbate and is the result of a successful series of extensive tests with the pigment on galvanized and ordinary steel surfaces. Further investigations are taking place to determine its suitability for use underwater.

The third in the anti-corrosive primer group consists of a thixotropic zinc chromate primer based on an alkyd vehicle.

To complete the picture, the company has produced a top coat based on thixotropic alkyds that will produce a dry film thickness of approximately 3 mils with one application.

A paint film of six or seven mils can, therefore, be obtained by using one of the three new primers combined with the new top coat, instead of using four coats of the conventional anti-corrosive paints.

RECENT DEVELOPMENTS in SOVIET PAINT TECHNOLOGY

One of the biggest aims of Soviet resin research is the formulation of coating resins free of vegetable oils, glycerine and phthalic anhydride. Lack of these basic chemical intermediates has spurred interest in the development of phenolic, vinyl and latex emulsion coatings.

In the field of ship coatings, the Soviets have had success with a phosphatized vinyl-acrylic type primer, vinyl coatings containing a high content of cuprous oxide, zinc rich paints, and rubber coatings.

Of particular interest have been the development of bactericidal paints by the Soviets. Bactericidal activity of such paints is said to last as long as 400-500 days.

Synthetic Resins

The development of the Soviet lacquer industry depends in a large measure on the development of synthetic film-forming substances, lacquer resins, and cellulose esters. According to the resolution of the 20th Congress of the USSR Communist Party, not only edible oils but all vegetable oils used in the lacquer industry are to be replaced eventually with synthetic materials.

Recommendations for achieving this goal are:

a) The synthesis of intermediates (alkyl phenols, dibasic acids, aldehydes, etc.) for various lacquer resins, and copolymers of vinyl compounds with oils, aiming at replacing vegetable oils, and also increasing the assortment of paint and lacquer material):

b) The synthesis of various film-forming substances of the high-polymer type intended to fully replace vegetable oils (edible and non-edible);

c) Water emulsion systems: polyvinyl acetate latexes, latexes of copolymer of styrene and butadiene, emulsions based on copolymers of styrene with oils, and emulsions based on alkyd resins.

In the area of phenolic resins, the following steps should be taken:
1) To organize the production of *p*-tertiary butylphenol by alkylation of phenol with isobutylene, using isobutylene from the butane-butylene fraction, or prepared from isobutyl alcohol;
2) Raise the production of dimethylphenyl *p*-cresol, which is to be used as a component for synthesizing resins.
3) To derive phenols from shale in the form of a standard mixture;
4) To improve the synthesis of diphenylolpropane based on phenol, acetone or other ketones, using catalysts (such as compounds containing mercapto-groups) to improve the yield;
5) Broaden scientific research aimed at new ways of synthesizing diphenylolpropane based on phenol and cumene hydroperoxide.

The production of urea and melamine-formaldehyde resins in the USSR has reached a point, where further development is necessary.

Production of film-forming compounds based on copolymers of styrene and other vinyl compounds with vegetable oils should be organized, to result in economizing on oils, phthalic anhydride and glycerine.

From among high polymers, the substances most interesting for the lacquer industry are resins based on vinyl chloride and its various copolymers with other vinyl compounds such as vinyl acetate, styrene, etc.)

Copolymers of vinyl chloride with vinyl acetate, styrene etc. should receive wider application. Partially saponified copolymers of vinyl chloride and vinyl acetate

possess good adhesion to various materials and have been used with success in the Leningrad Anti-Corrosion Laboratory.

Resins (prepared at the Moscow Institute for Chemical Machinery) based on copolymers of vinyl chloride and styrene are creating great interest. They are soluble in aromatic hydrocarbons and ketones, and may be produced in concentrated solutions.

To attain the production of these types of coatings, effort must be directed to the availability of basic intermediates such as isocyanates, diphenylpropane, etc. needed in the synthesis of polyurethanes, epoxies, etc.

Nitchberg and Gurevich have tested water-emulsion paints and have developed a technique for large scale production of emulsion paints. Commercial operation is expected in the very near future.

Ship Paints

Phenol formaldehyde resins, copolymer of vinyl chloride and acetate, polyisobutylene, perchlorovinyl, ethyl cellulose, alkyd resins, bitumen, polyvinylbutyral, polybutylmethacrylate, copolymer of vinyl and vinylidene chlorides, polystyrene, etc. were tested as binders for ship paints and, partially, as anti-fungus substances. The effect of various additives, pigments and fillers, and of the volumetric ratio between binder and the toxic additive for fungus growth prevention were also investigated.

The following systems for shipshell coating represents a considerable achievement:

a) Phosphatizing polyvinyl butylacrylic primer;
b) Anti-corrosion paints based on partially saponified copolymer of vinyl and acetate chlorides;
c) Fungus-preventing paints based on copolymer of vinyl and acetate chlorides, with a high content of cuprous oxide.

The coating dries fast, and retains its anti-fungus properties up to two years. High pigmentation with Cu oxide (70-80% of dry film) is a necessary condition. On this basis, compositions were prepared which partially employ non-toxic pigments or fillers such as Zn white, Fe oxide, talc and other mineral substances. Pigmentation (by volume) of such paints should not be lower than 50-55%, while the ratio of toxic to non-toxic pigment should not be less than 2:1 (by volume). Such paints (containing only up to 30% cuprous oxide) were tested in the Black Sea with success.

Coatings for Tanks

As a result of three-year tests in the field and at the Leningrad Institute for Chemical Machinery, the following materials were recommended as most suitable for protection of tanks, etc.:

1) Protective paints based on copolymer of vinyl chloride and vinylidene chloride (SVKh-40), applied over phosphatizing or mixed primers. (Mixed primers are mechanical mixtures of substances based on low-molecular binders, which harden at normal temperature, and high-molecular resins such as SVKh-40).
2) Aluminum paints, based on phenolic resins, applied without primer and in three layers. The first two coats are dried by hot (60-70°C) air in five to six hours; the third coat dries at atmospheric temperature.
3) Protective paints containing large amounts of Zn powder; the last (third) coat may be substituted with aluminum paint.
4) Protective paint KhS-78, based on partially saponified copolymer of vinyl and acetate chlorides, with addition of hardener (ultimately, the film contains a minimum amount of free functional groups).
5) Rubber (SKN - 26, SKN - 40) - based coatings, modified by phenol-formaldehyde resins.
6) Asbovinyl (asbestos) coatings.
7) Unpigmented coatings based on lacquer VIAM-BZ or on phenolic lacquer with special acidic hardeners (such as Petrov's "contact" reagent, phosphoric acid). These systems have the disadvantage of being brittle, and are recommended for protection of fresh-water tanks including those for drinking water only.

Bactericidal Paints

The VNII paint and lacquer labtory has studied the problem of preparation and properties of bactericidal paints and varnishes. As a result of this work, the Soviet Union has prepared, for the first time, bactericidal paints and lacquers based on nitrocellulose and pentaphthalic.

These materials were found to exhibit bactericidal activity against all forms of non-spore microbes. In rigid conditions, they remain active for a minimum of 400-500 days.

Quantitative ratios were established for the components of bactericidal paints and lacquers, at which the latter retain their protective, paint-technological and decorative characteristics, and also acquire bactericidal ability.

The bactericidal lacquers form films which age slower than ordinary paints, both in darkness and in the light. Their crack resistance is higher than that of analogous non-bactericidal materials.

Diffusion was found to be the mechanism of action of the bactericidal component in the paints and lacquers; therefore, insoluble components in these materials do not exhibit a bactericidal effect. A film must also have a certain minimum porosity, to allow the diffusion of the soluble bactericidal component to the surface.

SOVIET and POLISH ABSTRACTS

Latex Coating For Binder's Cloth

By A. A. Isakov & E. A. Goldovskii, "Legkaia Promyshlennost'," Vol. 18, 9:29-30, 1958.

Binder's cloth treated with a coating based on the SVKh-1 latex is said to be free of drawbacks and superior to calico. Neither the polymethylacrylic nor the polymethylmethacrylic emulsions were alone satisfactory; the SVKh-1 latex (a product of copolymerization of vinyl chloride and vinylidene chloride), however, when thickened with a small amount of plasticizer and large quantity of filler, forms a film of satisfactory elasticity, stability to water and color fastness. The preparate was thickened by boiling corn starch in the latex in presence of stabilizing compounds (ammonia and dibutyl phthalate). The following are the components (in parts by weight) of the face and reverse side films on binder's cloth:

	Face	Reverse
Resin SVKh-40 (based on Latex SVKh-1)	100	100
Corn starch	25	30 (for 30% latex)
Kaolin, pigments, lacquers	75	130
Dibutyl phthalate	30	30
Ammonia	5	5 (for 30% latex)
Ammon. casseinate	1	1.5
Direct dyes	as needed	

Catalytic Solidification of Polydimethylsiloxane

By N. B. Baranovskaia, M. Z. Zakharova, A. I. Mizikin, & A. A. Berlin, "Doklady Akademii Nauk SSSR," Vol. 122, 4:603-606, 1958.

Preparation of three-dimensional alkylpolysiloxanes, based on the reaction of hydroxyl groups of linear polydimethylsiloxanes with aloxy groups of polyfunctional organosilic monomers, is described; from the point of view of energy, this process is held preferable to the splitting of H or an alkyl radical from polymer chain. The authors studied the nature and catalytic effectiveness of the ethyl, propyl and butyl esters of orthotitanic acid, and of a number of organotitanium compounds. The described method of "cold" vulcanization of liquid and rubber-like polydimethylsiloxane polymers may also be used for the preparation of various resinous materials, casting compositions, coatings and compounds solidifying at room temperature. The stability of organosilicon resins, obtained by this method, is 1.5-2 times higher than that of resins of the same structure but prepared by two-stage vulcanization at 150-200°C in presence of benzoyl peroxide, and is retained for long periods of time at temperatures of 200-250°C.

Ferric Aluminum Reds

By M. Kranz, "Przemysl Chemiczny," Vol. 37, 5:349-352, May 1958.

Ten sorpitive ferric aluminum preparations were obtained from solutions of ferric and aluminum sulphates through their basic salts. The influence of chemical composition and of experimental conditions on the quality of the compounds was determined. The disintegration was examined by physicochemical methods, and color was ascertained colorimetrically using the Lovibond-Schoffield tintometer. Bound aluminum oxide exerts positive influence on the quality and color of the preparations. The author established conditions under which best products were obtained. Separate precipitation of basic ferric and aluminum sulphates, their subsequent mixing, and the rapid addition of soda affected advantageously the disintegration; the rate of precipitation was then higher than the rate of arrangement (Haber rule). Insufficient amounts of soda and simultaneous precipitation of basic ferric and aluminum

sulphates led to optimum conditions for obtaining a clean red color of the pigments. The methods described may find application in the manufacture of ferric composition reds.

Some Problems of Urea-Formaldehyde Resins

By T. I. Rabek, "Przemysl Chemiczny," Vol. 37, 5:358-360, May 1958.

The paper describes the application of several pH regulators in the reaction of polycondensation of urea and formaldehyde. The following pH regulators were tested: H_2O_2, KC1, HCOOH, $(NH_4)_2S_2O_8$. The results indicate that under very harsh reaction conditions (pH< 4.8) and on the application of some pH regulators such as HC1 or $(NH_4)_2S_2O_8$ the reaction rate is too high, and the process becomes difficult to control; the products obtained are not easy to stabilize because of their heterogeneity. The best results were obtained with using H_2O_2 as pH regulator. The author confirmed his laboratory results by observations carried out on commercial processes. A method has been worked out for a rapid estimation of the quality of urea suitable for condensation with formaldehyde.

Clyphthalic Resins Modified By Tall Oil

By M. F. Sorokin, "Khimicheskaia Promyshlennost'," 6:346-349, September 1958.

In view of the general usefulness of tall oil in the paint industry, the author had earler described a method of producing a drying oil for paints, consisting in the synthesis of tall oil-modified glyphthalic resin, subsequently dissolved in petroleum oil. The synthesis of tall oil-modified glyphthalic resin consists of two steps: esterification of tall oil acids by glycerine, and subsequent condensation of phenol glycerides with phthalic anhydride. The author studied the effect of temperature conditions on both steps, and the influence of catalysts and of initial component proportions on the formation of tall-oil resins. Esterification takes place at temperatures of 120°C-220°C without catalysts or with catalysts (0.05% of CaO, MnO_2, PbO were used). The change in acid number and in amounts of volatile products separated esterification of tall oil by glycerine (with and without catalyst) was tabulated against time. The ratio of initial components in the synthesis was as follows: tall oil 75%, glycerine 11%, phthalic anhydride 14%; the latter was taken in surplus. The paper describes conditions of the synthesis, and the yields which ranged between 83-92%. Compositions of drying oils prepared on basis of tall oil-modified glythphalic resins are tabulated and indicate the following characteristics: acid number, full drying time, elasticity (in *mm*), impact resistance (in kg/cm).

Polymerization of Chlorine Derivatives of Styrene

By G. V. Tkachenko, L. V. Stupen', V. S. Etlis, & L. P. Kofman, "Zhurnal Fizicheskoi Khimii," Vol. 32, 10:2251-2255, October 1958.

An investigation of the polymerization of β,β-dichlorostyrene, α,β,β-trichlorostyrene, and of their copolymerization with vinyl chloride. α,β,β-trichlorostyrene does not polymerize under the influence of either free radicals of Friedel-Crafts catalysts. The polymerization of β,β-dichlorostyrene proceeds by cationic mechanism. The rate of copolymerization of the two derivatives with vinyl chloride decreases on increases in content of the former; when their content exceeds 0.5 molar fractions, low-molecular compounds form. The copolymerization of vinyl chloride with α,β,β-trichlorostyrene reduces the temperature of vitrification, in comparison with polyvinylchloride; this effect increases with the increasing content of α,β,β-trichlorostyrene in the copolymer.

New Corrosion-Resistant Materials

By I. A. Klinov, "Khimicheskaia Nauka i Promyshlennost'," Vol. 3, 4:492-499, August-September 1958.

The entire issue of *Khimicheskaia Nauka i Promyshlennost'* (No. 4, 1958) is devoted to the problem of corrosion protection and inhibition. The present paper discusses developments in materials such as glass, email; materials based on silicon, organic basis (coal graphite, plastics). Progress in the USSR and abroad is reviewed, with a 62-item bibliography appended.

Bulk Polymerization of Benzyl Methacrylate

By J. Majer, "Chemicky Prumysl," Vol. 8, 6:324-327, June 1958.

A study of the influence of initiator concertration and temperature on the overall rate of polymerization of benzyl methacrylate. The rate was found to vary as the square root of the benzoyl peroxide concentration, and its logarithm is a linear function of the reciprocal of the absolute temperature. From among the metal, the presence of lead is detrimental. Oxygen gas exerts an inhibitory influence. Several characteristics of monomer, prepolymer and the end product are reported fror the viewpoint of technological production of block polybenzyl methacrylate.

Coagulation of Polystyrene Latex

By U. N. Tsvetkov & E. M. Aleksandrova, "Khimicheskaia Promyshlennost'," 5: 280-283, August 1958.

A study of the possibility of non-electrolytic coagulation of polystyrene latexes by mechanical disturbance of stabilizer films adsorbed on solid latex particles. The relacionships between the time of stirring, latex concentration, number of revolutions, and temperature are expressed by equations. The coagulation by mechanical stirring has an autocatalytic character. A method is proposed for the investigation of the stability of adsorption films on latex particles, and a comparison of structural-mechanical properties of films of various stabilizers is presented.

Toxicity of Titanium And Its Compounds

"Chemicky Prumusl," Vol. 8, 5:254-255, May 1958.

A brief summary of the results of research on toxic effects of titanium and its compounds, and of the industrial safety recommendations, as carried out at the Soviet Institute of Physicians in Moscow. At some industrial titanium-processing sites, the amount of TiO_2 in the air reaches the amount of 500 mg in lm^3; when this amount has been administered in solution to animals, no external pathological effects were observed during the life of the subjects. However, post-mortem examinations revealed microscopic pathological changes in the animals' bronchial organs. Titanium chloride has proved far more toxic, causing lung infection etc. Some safety recommendation for industrial sites are given.

Measuring Liquid Viscosity

By N. V. Dudarchik, S. S. Urazovskii, & P. A. Cherniavskii, "Zavodskaia Laboratoriia," Vol. 24, 10:1278-1279, October 1958.

Description and diagram of an instrument for the determination of viscosity of liquids, featuring automatic reading of the time of discharge. It operates by making use of photolectric impulses, generated whan a ray passes through the moving meniscus of the liquid, to connect and disconnect an electric stopwatch. The accuracy of the device is said to be limited only by the thermostat and stopwatch quality.

Lacquer For Wire Tensometers

By S. I. Malkov, B. D. Nessonov, V. A. Matveev, & G. D. Nessonova, "Zavodskaia Laboratoriia," 9:1166, September 1958.

A coating for wire tensometers, prepared at the Moscow Institute of Chemical Technology is based on combining ortho-silicic acid esters with iditol and magnesium oxide ("lacquer No. 216"). Four coats, each drying in 1.5-2 hours, are applied on the instrument. Drying temperature 17-20°C. The lacquer, which is manufactured at "Faneroprodukt," (Novosimonovskaia sloboda 2, Moscow), is said to satisfy all demands.

Total Oxidation Products In Vegetable Oils

By V. P. Rzekhin & N. I. Pogonkina, "Masloboino - Zhirovaia Promyshlennost'," Vol. 24, 10:6-9, October 1958.

A modification of the Farion method for the determination of total oxidation products in vegetable oils is recommended despite some drawbacks. The method and calculations are described. The procedure permits to establish the total contents of oxy-acids, of the products of saponification of dimers, and of the condensation products of some carbonyl derivatives of fatty acids formed during fat saponification. The method may be suitable to partially determine acid oxides, and saturated and unsaturated monooxyacids.

Synthesis of Simple Vinyl Esters Containing Silicon

By A. D. Petrov & S. I. Sadykh-zade, "Doklady Akademii Nauk SSSR," Vol. 121, 1:119-122, July 1958.

The incorporation of silicon into simple vinyl esters, whose polymers are used in the USSR for preparing lacquers etc., is reported. Acrolein (112g) and 0.1N platinum hydrochloric acid (0.5ml) in isopropyl alcohol were mixed in container; with constant stirring, 20g of $(C_3H_5)_2SiH$ (from a total of 174g) added, gradually adding the rest while keeping temperature under 45°C. The mixture (260g) was distilled in vacuo to yield small amounts of $(C_2H_5)_3Si\text{-}O\text{-}Si(C_2H_5)_3$, 40g of remaining polymer, and 160g of B-methylvinyloxy-triethylsilane.

Corrosion Inhibitors

By I. L. Rozenfeld & V. P. Persiantseva, "Khimicheskaia Nauka i Promyshlennost'," Vol. 3, 4:500-505, August-September 1958.

A bibliographic review of recent work in the area of corrosion inhibition by volatile inhibitors, and inhibitors for acid and neutral media. The references cite mostly Soviet sources and workers.

NEWS

NEWS OF COMPANIES, ASSOCIATIONS
TECHNICAL GROUPS
ITEMS OF GENERAL INTEREST

Annual Southwestern Paint Convention

"New Products, New Markets—Through Creative Technology" is the theme of the Annual Southwestern Convention of the Houston and Dallas Paint and Varnish Production Club which will be held in Houston at the Shamrock-Hilton Hotel, April 23, 24 and 25.

Featured this year will be two full days of technical meetings, focused on the convention theme, and a raw material and equipment exhibit. The program is designed to stimulate creative thought, to show ways to create new products and new markets, and to check the inroads made by competitive industries.

The technical program and raw material and equipment show will be presented on Friday and Saturday, April 24 and 25.

The convention is under the general chairmanship of Quentin E. Nelson with Ruth J. Henly in charge of the Ladies' Program. Reservations should be made with Bruce Davidson, Registration Chairman, Box 10, Shamrock-Hilton, and hotel reservations directly with the Shamrock-Hilton. Allen Craig, Jr., #1 Briar Dale Court, Houston, Texas, is in charge of the raw material and equipment show.

TECHNICAL PROGRAM

Thursday, April 23

8:00 A.M.- 5:00 P.M.—Registration

Friday, April 24

8:00 A.M.- 5:00 P.M.—Registration
8:00 Raw Material Exhibit
9:30 Invocation & Opening of Convention
10:00 "Fluid Applied Roofing," By Kenneth C. Smith, E. I. DuPont
10:45 "The Use of Silicone Organics in Maintenance and Trim Enamels," By R. C. Hedlund, Dow Corning Corp.
11:30 Raw Material Exhibit
12:30 P.M. Luncheon & Speaker
2:00 "Liquid Epoxy Resins For Coatings," By S. H. Richardson, Union Carbide Plastics Company
2:45 "Polyamides in Solventless Coating Systems," By D. E. Terry, General Mills
3:30 Production Club Papers
4:00- 6:30—Raw Material Exhibit

Saturday, April 25

8:00 A.M.-11:00 A.M.—Registration
8:00 Raw Material Exhibit
9:30 "Polyesters For Surface Coatings," By J. G. Weinmann, Reichhold Chemicals, Inc.
10:15 "Technique For Applying Thick Paint Films," By R. W. Stephenson, Oronite Chemical Co.
11:00 Raw Material Exhibit
12:30 P.M. Luncheon & Speaker
2:00 "Magic of Fire," Presented by the Bureau of Mines Sponsored by Hercules Powder Company
3:30 P.M.- 5:00 P.M.—Speakers' Round Table, Moderator—Otto J. Mileti, Jr.

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Mattiello Library Moved

The Mattiello Library has been moved to the new quarters of the Polytechnic Institute of Brooklyn at 333 Jay Street, on the first floor.

The Mattiello Collection was established by The New York Paint and Varnish Production Club and presented to the Polytechnic Institute in honor of Dr. Joseph J. Mattiello (1900-1948), an alumnus of Polytechnic. He was an outstanding scientist, president of the New York Club in 1939 and Federation president in 1943. A trust fund was established to maintain the library and to provide new books. The Library comprises hundreds of volumes on paint, varnish, lacquer and the coatings industry. New books are added annually.

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Glidden Plans Center

Plans for the immediate construction of a million-dollar inorganic research and development center at Baltimore were announced by George M. Halsey, vice president in charge of The Glidden Company's Chemicals–Pigments–Metals Division.

The new Glidden laboratory, to be located on the site of the company's Adrian Joyce Works, will consolidate all of the division's activities in connection with inorganic chemical research, product development and technical service. Equipment will be transferred from other division research units throughout the country and the new laboratory will centralize all of its facilities.

The new laboratory will incorporate the most modern equipment available, including electron microscopes, various types of X-ray apparatus and spectroscopic analysis equipment.

The new laboratory is scheduled to be in full operation in September, 1959.

SCHOLARSHIP RECIPIENTS: Dean R. E. Dunbar, left, and Dr. A. E. Rheineck, right, shown with the recipients of the Trigg Foundation Scholarships at the North Dakota Agricultural College for the school year 1958-59. They are, left to right, Curtis Johnson, Rolan Kjosen, and Hans Wong.

NEWS

Pushbutton Paints Expects '59 Increase

American Can Co. has predicted a 20 per cent increase in production and sales of pushbutton paints in 1959.

Robert Hollister, of Canco's product marketing division, said 60 million cans of spray paints will be sold in 1959, an increase of 10 million over the 1958 figure. Emphasizing the steady growth of these products, Mr. Hollister pointed out that sales in 1957 amounted to 35 million units.

Mr. Hollister, who said the 20 per cent increase represents a "conservative estimate," noted that aerosol paint sales in 1958 amounted to about $50 million, compared with the total sales value of trade paints of $900 million.

James Bampton, president of Krylon, Inc. and the largest packer of aerosol paints, agreed with the 60-million-unit forecast, but stated that the figure may well be exceeded. The company is introducing a new product—reflective colors—that he thinks may account by itself for the sale of 10-million additional units in 1959.

Mr. Bampton foresees for the line "a tremendous future with use for military purposes, as a poster display aid, for precautionary painting, or any area that might require a reflective substance for safety purposes."

Optimism also prevailed at Benjamin Moore & Co. and at Red Devil Chemicals, Inc.

Horace F. Penney, vice president of Benjamin Moore, whose aerosol products are contract-packed by a Midwest loader, said, "We are introducing Retardo rust inhibitor paint in aerosols in 1959, are expanding our standard line of Utilac enamels about 50 per cent, are thinking of introducing marine finishes and are researching a new type of paint never before pressure-packed."

Connor F. Ryan, sales manager for Red Devil Chemicals, reported that "Our volume is going up so fast we won't have the chance to add any new products. For the present we'll be happy just keeping up with the demand."

Red Devil packs its own aerosols and also devotes about 25 per cent of its capacity to contract loading.

Mr. Ryan had a most optimistic outlook for 1959, estimating that "Our company should do two and a half times the business we did in 1958. Last year, after successfully formulating an aerosol paint, we increased our aerosol business ten fold."

All of the officials predicted steady growth in the demand for aerosol paints for years to come. One change may be in container size. Canco's Mr. Hollister said the company was working on a container bigger than 16 ounces to provide the consumer with a large and more economical amount of paint. More than half the aerosol paints marketed now are packed in 16-ounce cans, while the rest come in 12- and 60-ounce sizes.

"Basic convenience, increased quality of the package, better formulations of coatings and the elimination of the once bothersome problem of clogged valves have combined to give the consumer a safe, dependable product," Mr. Hollister said.

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PHTHALIC ANHYDRIDE PLANT: Dr. Stefan Baum, executive vice president of Reichhold Chemicals, Inc., addressing the group of civic officials and businessmen at the ground breaking ceremonies for RCI's new phthalic anhydride plant adjacent to their existing facility at Elizabeth, N. J. The $5 million plant will be completed later this year and will have an annual capacity to produce 30 million pounds of phthalic anhydride by the fluid bed catalyst technique.

R-M Diversification

The purchase of a controlling interest in the Wolverine Finishes Corp. by the Rinshed-Mason Co. of Detroit, Mich. has been announced by Frederick G. Weed, president of Rinshed-Mason Co.

Wolverine is a manufacturer of custom wood finishes for use largely by the furniture manufacturing industries. Wolverine employs about 100 people and maintains plants in Grand Rapids, Mich., Morganton, N. C., and Louisville, Ky.

The purchasing corporation, Rinshed-Mason, employs 750 people and has plants in Detroit, Mich., Anaheim, Cal., and Windsor, Ontario, Canada, and is a manufacturer of all types of industrial finishes.

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DuPont Safety Record

A new world's safety record in paint and varnish manufacturing operations has been established by the Du Pont Company's Philadelphia finishes plant and Marshall Laboratory, according to records compiled by the National Safety Council.

As of December 31, 1958, employees of the plant and laboratory had worked 12,064,800 man-hours without lost-time injury, over a period of 1,862 consecutive days, or more than five years.

This topped the previous record of 11,979,318 injury-free man-hours set by Du Pont's Parlin, N. J., finishes plant in 1949. The Philadelphia unit's safe performance continues, with 12,250,700 injury-free man-hours at the end of January, 1959.

NEWS

Flaxseed Association Program on Linseed Oil

On Wednesday, February 25th, the National Flaxseed Processors Association presented a Panel discussion entitled, *Let's Look at Linseed Oil*, before an invited audience of executive and technical personnel of local paint and varnish manufacturers. The members of the panel consisted of: Dan K. Farstad, Technical Sales Service, Spencer Kellogg & Sons, Inc.; James V. Porter, Technical Sales Service, Archer-Daniels-Midland Co.; and James Stanton, Technical Sales Service, Cargill, Inc.

The panel was introduced by Charles E. Morris, director of the Research & Development Dept., National Flaxseed Processors Association. The keynote of the program was then stated by Dan Farstad as follows: "While linseed oil is old, it is not old-fashioned. It still fills a vital need in the paint vehicle industry, and rather than becoming obsolete, is growing in importance with this rapidly expanding industry."

Some subjects covered in the discussion were:

1. The Composition and Chemistry of Linseed Oil.
2. What is New in Linseed Oil Research?
3. Current Status of Linseed Oil House Paints.
4. Blister Resistant House Paints.
5. Flat Exterior Finishes.
6. Attempts to Replace Linseed Oil.
7. Emulsion Finishes For Wood

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Mobay Expands TDI

Plans for a 50 per cent expansion of production capacity for tolylene diisocyanate (TDI) have been announced by J. R. Eck, president of Mobay Chemical Co. TDI is one of the basic chemicals used in the manufacture of urethane foam cushioning and insulating materials, elastomers and industrial coatings.

This will be the second major expansion of Mobay's plant at New Martinsville, W. Va., since it went on stream in 1956 and will increase the capacity of its TDI facilities to 18 million pounds a year. A similar 50 per cent expansion was completed by Mobay in the fall of 1958. Both are termed "incremental expansions" by Mobay to take full advantage of facilities provided in the original installation. This will permit the new facilities to be built in a minimum period of time, with completion scheduled for early 1960.

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Acrylic Emulsion Production

Reichhold Chemicals, Inc., has just equipped its plant in Ballardvale, Mass. for the manufacture of ten million pounds of acrylic emulsion a year, including a new line of products for the surface coating and leather finishing industries.

Reichhold has designated its acrylic ester emulsions as "Acripols," these being in addition to the several "Acripol" products which it has produced for the floor polish industry since late last year.

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Lawter Awarded Contract

The U. S. Navy has just awarded a contract to Lawter Chemicals, Inc., Chicago, Ill., to supply 13,000 gallons of bold "Safety-Sight" red-orange fluorescent paint and "Safety-Sight" clear sealer to help protect Navy aircraft against the hazards of mid-air collisions.

The use of bold "Safety-Sight" fluorescent paint has spread rapidly in the wake of recent mid-air collisions and now thousands of private and corporate aircraft are marked with these high visibility colors. "Safety-Sight" paint is also being used with increasing regularity on hanger and runway markings, TV and radio towers, airfield ground equipment, and cross-country air markers.

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New Dow Office

The Dow Chemical Company announced the opening of a sales office in Charlotte, N. C. The new office is located at 504 Wachovia Bank Building.

T. H. Caldwell, Jr., has been appointed manager of the office, moving up from his former post as manager of automotive chemicals sales.

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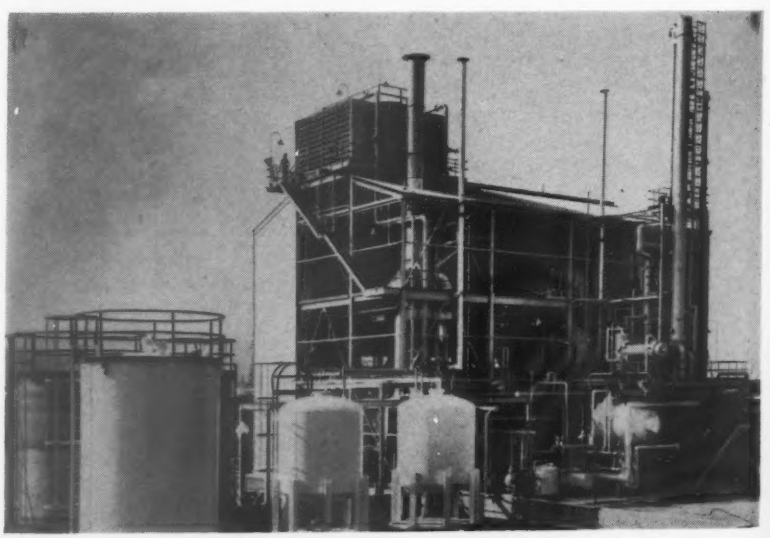
Huber Moves Office

The Industrial Products Department of J. M. Huber Corp. are now located at 630 Third Avenue, New York 17.

Huber has taken the entire twelfth floor of the new building in order to gain larger space for its New York City operations, it was stated by Gerald W. Harris, vice president.



MARKET DEVELOPMENT UNIT: Shell Chemical Corp. has announced the initial production from its market development unit, built at Martinez, Cal. The unit, costing about $2 million, is designed to produce semi-scale quantities (more than pilot plant but less than commercial batches) of the more promising industrial chemicals to come out of Shell's research activities.

NEWS

Canadian PVLA Makes Grant to Federation

The Canadian Paint, Varnish and Lacquer Association has made a grant of $3,500.00 to the Paint Research Institute of the Federation of Paint and Varnish Production Clubs.

Currently, the Institute has nine projects underway at schools in the United States and Canada. These are:

(1) "Repainting of Chalked Surfaces With Emulsion Paints"—Polytechnic Institute of Brooklyn.

(2) "Study of Vehicle Films"—Case Institute of Technology.

(3) "Adhesion and Adhesives"—University of Louisville.

(4) "Film Thickness on Structural Steel"—North Dakota State College.

(5) "Chemistry Related to High Molecular Weight Dioxanes"—Northwestern University.

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NEWS

Flaxseed Association Program on Linseed Oil

On Wednesday, February 25th, the National Flaxseed Processors Association presented a Panel discussion entitled, *Let's Look at Linseed Oil,* before an invited audience of executive and technical personnel of local paint and varnish manufacturers. The members of the panel consisted of: Dan K. Farstad, Technical Sales Service, Spencer Kellogg & Sons, Inc.; James V. Porter, Technical Sales Service, Archer-Daniels-Midland Co.; and James Stanton, Technical Sales Service, Cargill, Inc.

The panel was introduced by Charles E. Morris, director of the Research & Development Dept., National Flaxseed Processors Association. The keynote of the program was then stated by Dan Farstad as follows: "While linseed oil is old, it is not old-fashioned. It still fills a vital need in the paint vehicle industry, and rather than becoming obsolete, is growing in importance with this rapidly expanding industry."

Some subjects covered in the discussion were:

1. The Composition and Chemistry of Linseed Oil.
2. What is New in Linseed Oil Research?
3. Current Status of Linseed Oil House Paints.
4. Blister Resistant House Paints.
5. Flat Exterior Finishes.
6. Attempts to Replace Linseed Oil.
7. Emulsion Finishes For Wood

•

Mobay Expands TDI

Plans for a 50 per cent expansion of production capacity for tolylene diisocyanate (TDI) have been announced by J. R. Eck, president of Mobay Chemical Co. TDI is one of the basic chemicals used in the manufacture of urethane foam cushioning and insulating materials, elastomers and industrial coatings.

This will be the second major expansion of Mobay's plant at New Martinsville, W. Va., since it went on stream in 1956 and will increase the capacity of its TDI facilities to 18 million pounds a year. A similar 50 per cent expansion was completed by Mobay in the fall of 1958. Both are termed "incremental expansions" by Mobay to take full advantage of facilities provided in the original installation. This will permit the new facilities to be built in a minimum period of time, with completion scheduled for early 1960.

•

Acrylic Emulsion Production

Reichhold Chemicals, Inc., has just equipped its plant in Ballardvale, Mass. for the manufacture of ten million pounds of acrylic emulsion a year, including a new line of products for the surface coating and leather finishing industries.

Reichhold has designated its acrylic ester emulsions as "Acripols," these being in addition to the several "Acripol" products which it has produced for the floor polish industry since late last year.

•

Lawter Awarded Contract

The U. S. Navy has just awarded a contract to Lawter Chemicals, Inc., Chicago, Ill., to supply 13,000 gallons of bold "Safety-Sight" red-orange fluorescent paint and "Safety-Sight" clear sealer to help protect Navy aircraft against the hazards of mid-air collisions.

The use of bold "Safety-Sight" fluorescent paint has spread rapidly in the wake of recent mid-air collisions and now thousands of private and corporate aircraft are marked with these high visibility colors. "Safety-Sight" paint is also being used with increasing regularity on hanger and runway markings, TV and radio towers, airfield ground equipment, and cross-country air markers.

•

New Dow Office

The Dow Chemical Company announced the opening of a sales office in Charlotte, N. C. The new office is located at 504 Wachovia Bank Building.

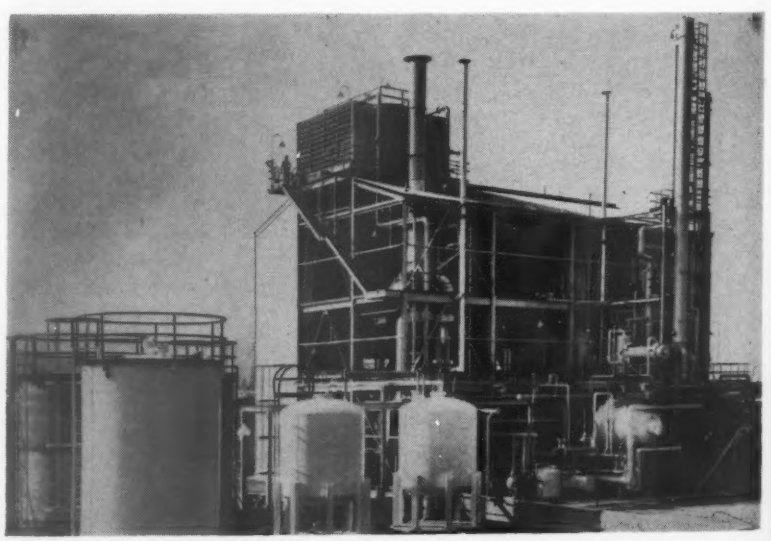
T. H. Caldwell, Jr., has been appointed manager of the office, moving up from his former post as manager of automotive chemicals sales.

•

Huber Moves Office

The Industrial Products Department of J. M. Huber Corp. are now located at 630 Third Avenue, New York 17.

Huber has taken the entire twelfth floor of the new building in order to gain larger space for its New York City operations, it was stated by Gerald W. Harris, vice president.



MARKET DEVELOPMENT UNIT: Shell Chemical Corp. has announced the initial production from its market development unit, built at Martinez, Cal. The unit, costing about $2 million, is designed to produce semi-scale quantities (more than pilot plant but less than commercial batches) of the more promising industrial chemicals to come out of Shell's research activities.

NEWS

Canadian PVLA Makes Grant to Federation

The Canadian Paint, Varnish and Lacquer Association has made a grant of $3,500.00 to the Paint Research Institute of the Federation of Paint and Varnish Production Clubs.

Currently, the Institute has nine projects underway at schools in the United States and Canada. These are:

(1) "Repainting of Chalked Surfaces With Emulsion Paints"—Polytechnic Institute of Brooklyn.

(2) "Study of Vehicle Films"—Case Institute of Technology.

(3) "Adhesion and Adhesives"—University of Louisville.

(4) "Film Thickness on Structural Steel"—North Dakota State College.

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PERSONNEL CHANGES

METASAP

Francis J. Licata has been appointed technical manager of the company's sales department, it has been announced.

Mr. Licata will be responsible for the development of new markets and new uses for metallic soaps.

Now in his thirtieth year with the firm, Mr. Licata is well known in the metallic soaps industry and holds many patents in the field.

A graduate of City College of New York, he holds a B. S. degree in chemical engineering. He has also done post-graduate work at Columbia University and Brooklyn Polytechnic Institute.

AMERICAN CYANAMID

Dr. L. L. Seivard has been named director research, organic pigments, it has been announced.

He will be responsible for research and development of new colored pigments.

Dr. Seivard has been with the firm since 1952 when he joined the company's Bound Brook, N. J., plant as a development chemist. He became chief chemist for the organic pigments manufacturing department in 1957.

Dr. Seivard is a graduate of Princeton University and of the Carnegie Institute of Technology. Before joining the firm, he was associated with E. I. duPont de Nemours & Co. and Shell Chemical Company.

AMERICAN-MARIETTA

J. Clifford Knochel has been elected a vice president in the Chicago headquarters office, it has been announced.

J. C. Knochel

With a background of chemical engineering, Mr. Knochel was associated for fifteen years in various research, production and sales capacities with E. I. du Pont de Nemours & Co.

Joining the Devoe & Raynolds organization in 1947 as sales manager of the resins and chemical division, he became vice president in charge of resins and chemicals, president of the Truscon Laboratories Division and vice president in charge of all Devoe trade sales. He was elected a member of the Devoe & Raynolds Co. board of directors in 1955.

EMERY INDUSTRIES

Dr. Ulrich W. Schneibler, Dr. Clarence F. Huber, and **Joseph A. Roux** have been added to the research staff, it has been announced.

Dr. Scheibler has been with the Diamond Alkali Company in Painesville, Ohio, since 1957, prior to which he was with the Schering Company in Berlin. He will conduct fundamental research involving mechanisms and structures of organic compounds in the basic research section.

Dr. Scheibler is a graduate of both the undergraduate and graduate schools of the Techniche Universitat in Berlin.

Prior to joining the firm, Dr. Huber was chief chemist at Carlisle Chemical Works, and has also been associated with the Lubrizol Corp. He will conduct research on the utlization of products for the application research section.

Dr. Huber received his Ph.D. from Case Institute of Technology, M.S. from the University of Illinois, and A. B. from Wabash College.

Mr. Roux will work with the textile research group, developing new products and providing field service for the line of textile finishing agents and processing oils. He was previously with the B. F. Goodrich Chemical Company's Parvan fibre project, and has also been associated with Lowell Technological Institute Research Foundation and the United Elastic Corp.

A graduate of Lowell, he also holds a Master of Science in Textile Chemistry from that Institute.

SAGINAW PAINT

A. L. Cipriano has joined the staff as technical director and production manager, it has been announced.

A. L. Cipriano

Mr. Cipriano, prior to this affiliation, had been head of the Industrial Latex Paint Group at the Dow Chemical Company's Midland Plant.

He will devote much to his effort to the advancement of new products, with particular attention given to latex, silicone, epoxy, and acrylic formulations.

Mr. Cipriano is a graduate of Fordham University with a B. S. degree in Chemistry, class of 1942.

GLIDDEN

Arthur C. Dreshfield has been appointed director of paper research and development for the chemicals-pigments-metals division, it has been announced.

In this newly-created position, Mr. Dreshfield will direct all research and development activities as well as technical sales services in connection with the chemicals-pigments-metals division's expanding program of services. He will be headquartered at the division's new papermaking and coating research laboratory in Baltimore.

Mr. Dreshfield is a veteran of 35 years in the pulp and paper industry, and has served since 1947 as a private consultant to the industry. Prior to that, he was associated with the Hercules Powder Co.

ALLIED CHEMICALS

Byron R. Wardle has been named to the post of marketing supervisor, Plaskon plastics and resins, it has been announced.

B. R. Wardle

In his new position, Mr. Wardle will assist plastics and resins customers to enlarge the marketing areas for their end-products. His responsibilities will include coordination and development of marketing, public relations and advertising programs.

These duties were formerly handled by **Robert K. White,** recently named assistant director of advertising.

Mr. Wardle joined the Plaskon staff 1955 as sales promotion representative. Previously he was assistant manager, foreign remittances, American Express Co.

HERCULES POWDER

New assignments for two technical representatives and a realignment of territorial sales responsibility have been announced.

R. C. Bogott, currently technical representative in the Boston district, has been transferred to the Chicago district. **Bruce J. Hall,** currently technical representative in the Chicago district, has been transferred to the Cincinnati district.

It was also announced that the Cincinnati district will be expanded to include all of southern Ohio, the western portion of West Virginia, the western portion of Tennessee, and the southwestern portion of Indiana, in addition to present territorial responsibility.

The synthetics department also announced that **James G. Antonak,** who has been senior technical representative in the Chicago suboffice at St. Louis, is leaving the company, and that in the future the Chicago office will be responsible for technical representation in the St. Louis territory. However, the St. Louis office will continue to handle synthetics department order detail for that area.

COMMERCIAL SOLVENTS

Harry Field has joined the sales staff, it has been announced.

H. Field

Mr. Field, who will be responsible for the sales of industrial chemicals in Cleveland and Pittsburgh areas, replaces **Russell T. Smith** who is on a military leave of absence.

Prior to his joining the firm, Mr. Field, a chemistry graduate from Western Reserve, was with the Ferro Corporation.

LAWTER CHEMICALS

James G. Antonak has been appointed manager, resin sales, it has been announced.

J. G. Antonak

Mr. Antonak brings to his new position many years experience at both the research and sales level of resin products and was formerly in charge of the St. Louis office of the synthetics department of Hercules Powder Company.

Mr. Antonak graduated from Michigan State College with a B. S. in chemistry and received his M.B.A. from the Harvard Business School.

UNION CARBIDE CHEMICALS

Lester D. Berger, Jr. has been appointed assistant manager of the new chemicals group, it has been announced.

In his new position, Mr. Berger will be responsible for the major development areas of water-soluble chemicals and surface-active agents.

Two product managers—**Sebern G. Sellers** and **Eugene P. Fisler, Jr.**—were appointed to assist Mr. Berger. Mr. Sellers will be responsible for Polyox water-soluble resins and Cellosize hydroxyethyl cellulose. Mr. Fisler will be responsible for Tergitol surfactants.

Mr. Berger joined the firm in 1940 after receiving a B. A. degree in chemistry from Harvard University. Previous to his promotion, he was a product manager in the new chemicals group.

Mr. Sellers received B. S. and M. S. degrees in chemistry from the University of South Carolina in 1952 and 1955 respectively. Previous to his promotion, he was a technical representative in the new chemicals group.

Mr. Fisler, previously in field sales as a technical representative in the Delaware Valley district, joined the company in 1950 after receiving a B. S. degree in chemistry from the University of Delaware.

SHELL DEVELOPMENT

Dr. R. W. Tess has been appointed a research supervisor at the Research Center, it has been announced.

R. W. Tess

Dr. Tess will supervise the research activities of the surface coatings group in the firm's plastics and resins department.

Dr. Tess joined the staff on the Emeryville Research Center in 1944.

He received a B. S. degree in chemistry from the University of Illinois in 1939 and a Ph.D. degree in organic chemistry from the University of Minnesota in 1944.

NATIONAL CAN

Dr. Laverne E. Clifcorn has been named manager of research for the central division, it has been announced.

Dr. Clifcorn, who came to the firm from another can manufacturer where he was research associate and supervisor of metal container development and packaging, will exercise functional control over both manufacturing research and field research for the central division.

Dr. Cliforn also has been associate director of research of the metals division for another major can company. His job had included administrative responsibilities and coordination of outside research. Previously, he was a chemist for the State of Wisconsin.

Dr. Clifcorn received his Ph.D. in chemistry from the University of Wisconsin in 1934.

CROWN CORK & SEAL

Harvey C. Tull has been named regional sales manager of the newly created Central Region, it has been announced.

Mr. Tull, associated with the firm for 23 years, brings to his new assignment a broad and varied background in production, sales and customer service. Most recently, he was consolidated district sales manager at the firm's Philadelphia offices.

Apr. 22-23. 31st Annual Meeting of the Lead Industries Assn., The Drake Hotel, Chicago, Ill.

Apr. 23-25. Southwestern Paint Convention of the Dallas and Houston Paint & Varnish Production Club, Shamrock-Hilton Hotel, Houston.

May 22-23. Annual Symposium of the Pacific Northwest Paint & Varnish Production Club, Multnomah Hotel, Portland, Ore.

PRODUCTION CLUB MEETING

Baltimore, 2nd Friday, Park Plaza Hotel.
Chicago, 1st Monday, Furniture Mart.
C.D.I.C., 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April Suttmilers.
Columbus — Jan., June, Sept., Fort Hayes Hotel.
Cleveland, 3rd Friday, Cleveland Engineering & Scientific Center.
Dallas, 1st Thursday after 2nd Monday, Melrose Hotel.
Detroit, 4th Tuesday, Rackham Building.
Golden Gate, 3rd Monday, Sabella's Restaurant, San Francisco.
Houston, Monday prior 2nd Tuesday, Rams Club.
Kansas City, 2nd Thursday, Pickwick Hotel.
Los Angeles, 2nd Wednesday, Scully's Cafe.
Louisville, 3rd Wednesday, Seelbach Hotel.
Montreal, 1st Wednesday, Queen's Hotel.
New England, 3rd Thursday, University Club, Boston.
New York, 1st Thursday, Brass Rail, 100 Park Ave.
Northwestern, 1st Friday, St. Paul Town and Country Club.
Pacific Northwest, 3rd Thursday, Washington Athletic Club, Seattle, Wash.
Philadelphia, 3rd Wednesday, Philadelphia Rifle Club.
Pittsburgh, 1st Monday, Gateway Plaza, Bldg. 2.
Rocky Mountain, 2nd Monday, Republican Club, Denver, Colo.
St. Louis, 3rd Tuesday, Kings-Way Hotel.
Southern, Annual Meetings Only.
Toronto, 3rd Monday, Oak Room, Union Station.
Western New York, 1st Monday, 40-8 Club, Buffalo.

AIR REDUCTION

William H. Healey has been appointed new products manager, it has been announced.


W. H. Healey

He will be responsible for the introduction of new products and the development of new markets.

Mr. Healey was a sales engineer with General Aniline and Film Corp. for the past ten years.

A graduate of Massachusetts Institute of Technology, Mr. Healey also has been an engineer with Arthur D. Little, Inc., and with General Chemical.

GLYCO

Edwin O. Mills has been appointed technical representative, it has been announced.

Working out of the firm's Chicago office, Mr. Mills will cover Northern Illinois, Minnesota, and Wisconsin.

Mr. Mills received his B. S. degree in chemical engineering from the University of Nebraska.

DIAMOND ALKALI

Jerome A. Ryan has been appointed assistant manager of solvent sales, chlorinated products division, it has been announced.

Mr. Ryan has a background of 15 years experience in the technical sales service field. He joined the organization in 1954 as a serviceman in the technical service department.

He is a graduate of the University of Alabama, from which he earned his B. S. degree in Geology in 1942.

GODFREY L. CABOT

Organizational changes in the sales department of the minerals and chemicals division have been announced.

Henry P. Donohue, Jr. has been appointed Eastern sales mangger of non-ceramic industries and **Frank E. Daley** will be Eastern ceramic sales manager. **Warren M. Parsons** will be Western sales manager of non-ceramics and **Frank J. Zvanut** will be the Western ceramic sales manager.

Mr. Donohue, after receiving his B.S. in chemical engineering at Tufts University, joined the firm's research and development laboratories as a chemical engineer. He worked in applied and market research and in 1955 transferred to the minerals and chemicals division as product manager for Cab-O-Sil, the position he has held until his present promotion.

Mr. Daley has been with the sales department of the minerals and chemicals division since 1952. After graduating from Rutgers University, with a B. S. degree in ceramics, he spent five years as a ceramics engineer with American Radiator & Standard Sanitary Co. before joining the firm.

Mr. Parsons spent five years as a chemist in the chemical and paint industry before coming to the research and development laboratories in Cambridge, Mass. Later, he transferred to the minerals and chemicals division as a salesman. A graduate of Tufts University, Mr. Parsons holds a B. S. in chemistry.

Mr. Zvanut, holder of a Ph.D. in chemistry from the University of Missouri, an M. S. in ceramic engineering from the University of Washington and a B. S. in ceramic engineering from the Missouri School of Mines, came to the firm in 1952. Since joining the minerals and chemicals sales department, he was worked with the ceramic industries in the development and sales of white pigments. He previously worked as a sales engineer in the ceramic industry.

ADVERTISERS' INDEX

Widely Recognized as a Standard of the Industry!

Sovasol 35 is an isoparaffinic solvent that is practically odorless, water-white in color, doctor sweet, and extremely color stable. It comes to you spotlessly clean in tank cars. These qualities have made Sovasol 35 a standard of the paint industry.

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